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Let's Get on with Interstate Banking

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This article has several elements. There is a description of forces of change in the financial services industry. Next we present views of the most desirable long-run status of the industry. Then we consider the costs of transformation from the present situation in the industry to the preferred form. Finally, we reach conclusions as to the form and sequence of needed changes.

Forces of Change in the Industry

The financial service industry is changing rapidly for a number of basic reasons. First is the general rapidity of technological change in our society. Electronic funds transfer and other electronic and technical innovations are changing bank behavior. These changes will continue both in the state and the nation; attempts to get back to the good old days of nonelectronic service are useless.

Our society has subtle but forceful means of evaluating the effectiveness of our institutions. Fortunately, society also possesses the means of effecting change as it determines that institutions are inefficient in meeting our needs. This process has brought bank mergers and evolution throughout the United States. Attempts to slow these changes will only diminish Illinois's role in the larger banking community. Illinois, like every other state, must be efficient relative to its own laws and relative to the institutional setting throughout the nation and the world.

Long-Run Optimal Financial Services Industry

The financial service industry must satisfy two goals. First, the safety of banks is a primary concern. Indeed, the safety of deposits should be the focus of the regulatory process. For bank depositors, this is seen as insurance under FDIC or a similar system. Actions within the bank are an aspect of the insurance process.

Second, financial institutions must operate efficiently in accepting deposits and making loans. This includes providing good service to depositors — in the form of a variety of investment media — as well as paying the highest economically feasible interest on deposits. Similarly, the borrowers should be assured of good service, including the lowest economic interest rates available considering the risk of the loan. It is to be expected that this process would result in the most efficient allocation of capital. Finally, the bank itself should be efficient with the lowest feasible costs and smallest spreads between borrowing and lending rates.

Economists are consistent in advocating the competitive market system as the best way to achieve these goals. The competitive process insures that the costs to users are as low as possible, the interest rates on deposits are as high as possible, and that banks are effectively administered.

Although competition is singularly beneficial, we do not advocate an absence of regulation. It is possible for the benefits of competition to be overridden by market power obtained by one or a small number of financial service organizations. Regulation must insure that a chain of banks does not use its large size to drive individual competing banks out of business through temporarily low prices that are later raised. Banks and other financial institutions must face this scrutiny in their individual markets to insure that they do not undermine the beneficial effects of competition.

Banks in Illinois are now restricted in the degree to which they may participate in bank holding companies or have branches. Basically, the rules against branching cause the market for bank activity to be segmented into several different markets for each of the regions. If no branches or holding companies were permitted, there would be a market for funds in each individual community. It is argued that the deposits would stay in the community and the loans

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would be made in that community from local funds. In the extreme case, we might imagine a local market interest rate on bank funds.

For economic efficiency, however, there ought to be a single equilibrium interest rate. If a local interest rate in a community is below the equilibrium rate, and the interest rate on borrowed funds is also lower than the statewide level, there are two problems. First there is a loss to the depositors in the community. Second, there is a gain to the borrowers. But this means the depositors are subsidizing the borrowers. Overall, there is a net loss of efficiency in the broad community. Restrictions against branching work in this direction.

To the extent that a small community has little or no competition, there will be monopoly profits. Under such circumstances it is likely that there will be inefficiency in the bank staff. One result of the introduction of statewide banking will be the reduction of employees at the individual banks, requiring the remaining staff to work more effectively.

Whether there is a net gain within the narrow community under unit banks is open to question. Clearly, within the community there is a loss to depositors and a gain to borrowers in the situation we described. It is possible that community-restricted banking may temporarily aid local economic conditions. However, in the longer run the depositors will insist on a fair return on their funds, and even within the narrow community the gains from the situation will evaporate. But the general economy, including the state, is left with an ineffective banking system. In short, the competitive system is seen as the better choice.

Transformation Costs

We have indicated that a situation of competition would be helpful to the banking industry and to the users of banking services. In many cases, however, the transition from the present situation to another more desirable status may bring real costs. Such transformation costs probably exist in the banking business. In light of this, the optimal transition may take the form of a number of individual steps rather than a single major leap.

As branches are permitted, existing banks will face greater competition. They and the public will probably be best served by being given a period of time to adjust to their new competitive position. Similarly, aspects of the interstate banks have already come into being in the form of credit card systems and brokerage firms. As banks move to meet the new competition, they can benefit from some time in which to phase in the new competition.

While the system should move to more competition, this should be done at a pace that accomplishes the desired end but limits the difficulties of the transition.

Specific Current Issues

Consumer Banks

Sears, and probably others, have advocated a new kind of institution, the consumer bank. These banks would collect deposits from the general public and make consumer, but not commercial, loans. Also, companies engaged in different, far-reaching activities would be permitted to charter consumer banks. Federal law now prohibits firms from engaging in both retail business and general banking; therefore, Sears and other consumer service firms cannot engage in general banking activity.

What is gained by Sears if they have a consumer bank? They obtain access to a deposit base. Sears wishes to obtain deposits from the many people in the country with whom it already does business. The firm's stated purpose is to employ such funds to make consumer loans. One of the most carefully controlled activities is the collection of deposits from the general public, and access to this base would give any firm an increased opportunity to provide services to customers.

Proposed legislation would give consumer banks a special status in that they would not fall under federal banking legislation that applies to entities making commercial loans and taking in demand deposits. If these proposed consumer banks can get FDIC insurance for their deposits, yet escape the regulation that applies to other financial institutions, then an inequity will be created.

While society desires an efficient and competitive system, creating a new class of unregulated consumer banks with a different set (or no set) of rules does not seem to be a step forward. We already have nearly 40,000 depository institutions in this country. "Consumer banks" already exist in the form of savings and loan associations, credit unions, and the many banks that are oriented to retail business. We should unshackle the present forms of banking institutions in a reasonable fashion so that they can provide consumer services more efficiently.

If allowed, consumer banks would be a negative force. They would be restricted from making commercial loans, but would be a major force in obtaining deposits. Such institutions would bias the banking system in favor of consumer loans and against commercial loans. On the surface, this result seems to

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benefit consumers; but to the extent the restriction would make it more difficult for businesses to compete for funds, this would result in inefficiency and in a less effective economy in the long run. The loss of jobs and resulting poorer products would be a great disadvantage to the consumers of the state.

It should also be noted that major changes should occur in Illinois banking laws whether or not the consumer banks are permitted. Change that is too complex or too rapid carries with it a great cost to society and to the financial community. In the present case, the consumer banks would add to the complexity of the changes that would occur and would be a significant detriment to Illinois banks as well as to those across the nation.

In summary, the consumer banks would have unfair advantages over other banks in federal laws, cause a bias in the allocation of capital to the detriment of business and, hence, to consumers. Finally they would unnecessarily add to the transition difficulties in moving to a modern banking system. They should not be approved at this time.

Insurance Underwriting

In the longer run, banks and insurance companies should be allowed into each other's forum. Each should be limited, however, until both can compete in the other area. For the present, this is not a critical issue, and action should be delayed.

In-State branching

The banking system will be materially aided by the possibility of branching throughout the state. Neither California nor New York show any significant negative impact from the existing possibility to branch. Studies do not show that small firms in outlying areas have reduced possibilities for obtaining loans or that the big banks have eliminated the competition of smaller banks. On the other hand, there has been substantial benefit from the broader deposit base of the large banks and from the decreased need to fund operations from large interbank transactions that are short-term and subject to capital flight.

Moreover, branching within the state is needed simultaneously with or before interstate branching occurs. Therefore, a first priority should be the opportunity for in-state branching.

Multi-bank Holding Companies

Within the banking context, the holding company organization is an artificial form developed largely because of restrictions on branch banking. In terms of efficiency it seems to be dominated by the branch system. We recommend holding companies be allowed under the same rules as branch banks; but we expect that, in time, holding companies will become unimportant.

Interstate Banking — National

National interstate banking will require banks to compete and to have the initiative to participate in national markets. Banks in Illinois can succeed and build the banking community in the state through this process. We recommend that the community work towards this as its ultimate goal.

Interstate Banking — Regional

Regional interstate banking is a step forward and our banks could compete well in the region. If regional banking merely delays national interstate banking, however, it will not serve the state either in building its banks or in meeting the needs of banking consumers. Even so, the political situation or the need to limit the pace of the transition may dictate that regional banking is the best path for Illinois to follow in the deregulation process.

Summary

We believe that the transition to new competition will materially aid the users of financial services in the state and the nation. New forms of financial services will arise, and existing services will improve providing greater service and interest to depositors while allocating loans at competitive rates and more fairly to the ultimate consumer.

Illinois has long been a state where firms of all types have had fresh, innovative ideas and have been successful competitors in the market place. In banking, our state has been a leader in financial services despite the heavy burden of the limited deposit base forced on the banks by the unit banking laws of the past. We believe that under unlimited interstate banking Illinois will fare very well. We recommend it as the ultimate goal of the state. The transition should be made deliberately, however. The first step should be unlimited in-state branching. Then, transition problems and political realities may deem a multistate regional banking system to be needed as an intermediate stage before unlimited interstate banking can be achieved.

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REAL ESTATE DEVELOPMENTS

Trends in Illinois Racial Segregation in Housing: 1960–1980

Ann B. Schnare

The 1960s ushered in a series of social, political, and economic developments that might have dramatically improved the prospects for neighborhood racial mixing. Fair housing laws were enacted at all levels of government, blacks made rapid gains in income and education, and the attitudes of blacks and whites alike grew increasingly favorable toward integration.

These developments could have produced a significant decline in the segregation of urban blacks. But existing data indicate that, if anything, the opposite change occurred. In 1970, metropolitan blacks were more segregated from whites than they had been in 1960. This general phenomenon occurred in all regions of the country and in both high- and low-income neighborhoods. Indeed, in a comprehensive study, I found that over 75 percent of all metropolitan areas registered an increase in segregation during the 1960s.

Numerous popular accounts have alluded to an emerging tendancy toward the suburbanization of urban blacks — a development that could signal the weakening of segregated living patterns. However, what little empirical evidence exists suggests that increases in the rate of black suburbanization vis-à-vis that of whites may not be a widespread phenomenon. Even if it were, it s difficult to judge whether or not that increase represents the desegregation of housing markets or simply a spillover of urban ghettos into adjacent surburban areas.

This article examines recent trends in the nature and extent of segregation in nine Standard Metropolitan Statistical Areas (SMSAs) in Illinois. While the focus is on Illinois, comparable statistics have been generated for another 82 SMSAs throughout the country. The analysis is based on tract data from the 1960, 1970, and 1980 Censuses of Population and Housing. All statistics regarding the level and extent of segregation in 1960 and 1970 were drawn from my earlier study, "Trends in Residential Segregation by Race: 1960–1970" [*Journal of Urban Economics* (July 1980)].

The analysis presents two different measures of segregation — one absolute, one relative. The absolute measure examines changes that have occurred in households' exposure to members of a different racial group. The term "exposure" simply refers to the racial mix of an individual household's neighborhood. Black exposure to whites is the proportion of whites in the average black's neighborhood; and white exposure to blacks, the proportions of blacks in the average white's neighborhood. By themselves, exposure rates are fairly direct measures of the physical isolation of households. When the rates for both groups are close to zero, segregation is said to be high; when the rates for both groups are high, segregation is said to be low.

These absolute measures of segregation do not control for differences in the racial composition of urban areas; that is, a city that is predominately black can achieve levels of exposure different from those of a city that is predominately white. To control for this variation, the analysis employs an additional measure of segregation that compares the actual exposure rates of households to the exposure rates that would arise if blacks were evenly distributed throughout the metropolitan area; the latter is equal to the proportion of whites in the SMSA as a whole. This relative "exposure" index is constructed to range from a minimum of zero to a maximum of 100, with 100 depicting an area where tracts are either all white or all black, and with zero representing an area where each tract has the same concentration of blacks.

Trends in Exposure Rates

Table 1 presents information on trends in white and black exposure rates in Illinois between 1960

Table 1

Trends in Exposure Rates: 1960–1980

	Black Exposure to Whites			White Exposure to Blacks			% Black in SMSA	
	1960	1970	1980	1960	1970	1980	1970	1980
Bloomington/Normal	N/A	.934	.928	N/A	.018	.033	.019	.034
Champaign/Urbana/ Rantoul	N/A	.593	.656	N/A	.044	.068	.068	.092
Chicago	.158	.137	.151	.027	.030	.041	.176	.201
Davenport	N/A	.690	.709	N/A	.024	.033	.033	.044
Decatur	.810	.659	.631	.043	.056	.075	.079	.105
Kankakee	N/A	N/A	.321	N/A	N/A	.055	N/A	.144
Peoria	.555	.466	.575	.020	.021	.037	.044	.060
Rockford	.703	.601	.531	.030	.038	.044	.059	.075
Springfield	N/A	.626	.616	N/A	.032	.041	.049	.061

and 1980. In 1980, the state had a total of nine SMSAs. However, only four of these areas had achieved metropolitan status by 1960 and one area (Kankakee) did not become an SMSA until 1980. As a result, data for 1960 and 1970 are not always available.

As is evident from the table, black exposure to whites declined significantly between 1960 and 1970 in each of the four "older" SMSAs. This pattern is consistent with the widespread declines in black exposure that occurred throughout the country. However, trends in the 1970s were much more mixed. Four areas experienced an increase in black exposure to whites between 1970 and 1980, and four areas experienced a decline. The largest increases occurred in Champaign/Urbana and Peoria, while the largest decline was in Rockford. This mixed pattern contrasts to the universal increase observed in white exposure to blacks. This statistic has risen steadily since 1960 and now ranges from a low of 3 percent in Bloomington and Davenport to a high of 7.5 percent in Decatur.

To gain some perspectives on these trends, it may be helpful to consider how exposure rates might change from the simple process of urban growth. As an example, suppose that blacks live in a centralized, all-black cluster, surrounded by an integrated border or transitional zone. As the black population grows, the ghetto expands peripherally, with the border shifting outward into adjacent and formerly all-white neighborhoods, and with previously mixed neighborhoods becoming black. According to this simple model, black exposure to whites will tend to decline with the growth of the black population, reflecting the decreased size of border neighborhoods relative to the larger black interior. This is simply a matter of geometry: the periphery of a circle or square will grow less rapidly than its area.

Under this simple model, the change in the exposure of whites to blacks will depend on the overall change in the area's ratio of blacks to whites. When white growth is relatively slow, the expanding ghetto area will become large relative to the white sectors of the metropolis and the average exposure of whites will increase. When white growth is relatively rapid in comparison to the growth of blacks, the border will become less important relative to the white sectors of the market. The average white will then be exposed to a smaller proportion of blacks.

These simple examples suggest that differences in the size of a city's ghetto will lead to difference in the exposure rates of households. Thus, for example, Chicago had the largest black population in 1980 (about 1.4 million), as well as the lowest average exposure of blacks to whites (0.15). At the other extreme, black exposure to whites was relatively high in Bloomington/Normal (0.93), but the black population was extremely small (about four thousand). These patterns are consistent with a simple model of segregation in which interracial contact primarily occurs in border areas.

The simple model also suggests that black growth will typically lead to a decline in the exposure of blacks to whites if existing spacial patterns are maintained. This is what apparently occurred in the 1960s. Four SMSAs (Bloomington, Decatur, Rockford, and Springfield) experienced the same phenonmenon in the 1970s. However, four SMSAs (Champaign/Urbana, Chicago, Davenport, and Peoria) registered an increase in black exposure to whites. This development indicates a basic change in the spacial ordering of the households, either wider transitional areas around established black neighborhoods or an increase in the dispersion of blacks throughout the SMSA.

The increase in white exposure to blacks can also be interpreted in light of this simple model of ghetto growth. Each of the eight SMSAs experienced an increase in its overall proportion black between 1970 and 1980. Thus, it is not surprising that white exposure to blacks increased, even in instances where established racial patterns appear to have been maintained and where black exposure to whites declined. In such instances, expanding border areas simply become large relative to the white interior, thus increasing the exposure rate of the average white.

In an attempt to distinguish trends that may have occurred in different sectors of the housing market, we divided tracts in each SMSA into three roughly equal groups based on the incomes of their residents. High-income tracts have average family incomes that are in the upper third for the SMSA as a whole; middle- and low-income tracts will have average incomes in the middle and lower thirds, respectively. Exposure rates were then calculated for each of these three neighborhood types. Note that the classification of tracts can vary from year to year. Thus, for example, a declining neighborhood may have been classified as middle-income in 1970, and low-income income in 1980.

The resulting statistics are presented in Table 2. Due to the small number of areas with 1960 data, only 1970–1980 trends have been presented. As is evident from the table, black exposure to whites declined in most neighborhood types. Two areas — Champaign/Urbana and Peoria — had rising black exposure rates in low-income neighborhoods. Three areas — Champaign/Urbana, Chicago, and Decatur — had rising rates in upper-income tracts. The remaining cities and neighborhood types experienced significant declines. These patterns again contrast with the universal increase in white exposure to blacks across SMSAs and neighborhood types.

Trends in the Segregation Index

As noted earlier, "exposure" rates measure the level of segregation (or integration) in absolute terms. They do not control for the degree of contact that is possible in any area, given its overall racial mix. Thus, for example, white exposure to blacks can be higher in an SMSA that is 50 percent black than in

Table 2

Trends in Exposure Rates by Income of Tract

	Low-Income		Middle-Income		Upper-Income	
	1970	1980	1970	1980	1970	1980
Black Exposure to Whites						
Bloomington	.915	.902	.982	.955	.979	.963
Champaign	.509	.533	.938	.903	.948	.958
Chicago	.096	.071	.287	.216	.574	.631
Davenport	.661	.614	.971	.929	.986	.974
Decatur	.649	.588	.936	.660	.524	.910
Kankakee	N/A	.214	N/A	.861	N/A	.982
Peoria	.413	.468	.971	.959	.968	.931
Rockford	.574	.464	.860	.786	.989	.977
Springfield	.601	.547	.983	.969	.983	.971
White Exposure to Blacks						
Bloomington	.042	.071	.007	.020	.008	.021
Champaign	.092	.178	.017	.056	.024	.022
Chicago	.071	.132	.024	.050	.009	.020
Davenport	.067	.093	.005	.018	.004	.014
Decatur	.165	.197	.016	.039	.018	.026
Kankakee	N/A	.163	N/A	.030	N/A	.029
Peoria	.054	.108	.002	.010	.010	.027
Rockford	.102	.121	.012	.024	.002	.011
Springfield	.082	.142	.006	.014	.005	.013

an area in which blacks are a small minority. Table 3 presents an overall index of segregation that takes these differences into account and compares actual exposure rates to the rates that would arise if blacks and whites were evenly distributed across census tracts.

As is evident from the table, five SMSAs experienced a decline in segregation between 1970 and 1980. These were Bloomington, Champaign/Urbana, Chicago, Davenport, and Peoria. Three SMSAs — Decatur, Rockford, and Springfield — experienced a net increase. The relatively large number of declines contrasts with state and national trends observed in the 1960s, when the majority of SMSAs registered an increase in segregation. However, despite recent progress towards integration, housing markets remain highly segregated. This is particularly true for Chicago, which in 1970 was the most segregated market in the country.

Table 4 compares the Illinois experience in the 1970s to trends in 90 SMSAs located in various parts of the country. (Note that the data for the north central states include the eight SMSAs in Illinois). Segregation has tended to decline in the 1970s in all regions of the country, from an average of 0.578 in 1970 to 0.520 in 1980. While SMSAs in the North Central states continue to have the highest level of segregation, their situations have improved. Thus, while segregation has by no means disappeared, there is convincing evidence that the previous trend towards an increase the concentration of blacks has been arrested, if not reversed.

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Table 3

Trends in the Extent of Segregation: 1960–1980

	1960	1970	1980
Bloomington	N/A	.046	.039
Champaign/Urbana	N/A	.354	.275
Chicago	.814	.832	.807
Davenport	N/A	.283	.258
Decatur	.146	.283	.294
Kankakee	N/A	N/A	.624
Peoria	.423	.510	.388
Rockford	.267	.360	.425
Springfield	N/A	.333	.343

Table 4

National Trends in Segregation: 1970–1980

	1970	1980	Sample Size
North East	.476	.409	15
North Central	.668	.634	25
South	.577	.516	42
West	.587	.517	8
ALL	.578	.520	90

Inequities of the Graduated Income Tax

Richard F. Fryman

With the current debate concerning proposals for a flat rate income tax, it seems opportune to consider again an unsolved problem concerning our present tax that Congress has wrestled with for years: that is how to treat fairly married couples versus single people under the graduated federal personal income tax. The latest change in the tax laws by Congress aimed at this problem came in the Economic Recovery Tax Act of 1981, whereby in 1983 and thereafter the spouse with the lower income for two-worker couples can deduct 10 percent of gross income up to a maximum deduction of $3,000. This change reduced the so-called "marriage penalty" but by no means solved the general problem of equitable treatment of married couples vis-à-vis single people. Under the federal income tax we have a "marriage penalty" a "singles penalty," and now with the latest change, a "one-working-spouse penalty."

Problems involving the fair tax treatment of households in equal economic circumstances (for example, equal incomes) are referred to as horizontal equity problems. The horizontal equity problems associated with the graduated-rate federal income tax — including the problem of how to treat single versus married people — have been known and discussed for years. By using a hypothetical, two-bracket, graduated-rate income tax, this article shows why it can be argued convincingly that there is no fair solution to the problem of how to treat singles versus married couples fairly with a graduated rate income tax. It also shows that Congress's latest attempt has not solved the problem and may even have made it worse.

Under the federal income tax, a single individual will pay more tax than a married couple with the same taxable income, thus a "singles penalty." Ironically there is also a "marriage penalty" in that if an unmarried man and woman both earn about the same income, their combined income tax will be higher if they get married than if they stayed single. These problems arise directly from the graduated rates under the federal income tax.

An example can best show the difficulty. Suppose a hypothetical graduated rate income tax has the following rate:

Taxable Income	Marginal Rate
0–$10,000	10%
over 10,000	20%

Suppose there are three households as shown in the Table. Each household has a $20,000 taxable income: $10,000 each for Mr. and Mrs. Jones, $20,000 and zero for Mr. and Mrs. Smith respectively, and $20,000 for the unmarried Miss Williams.

There are three basic methods (and numerous combinations of the three) that we could use to tax the three households under the hypothetical graduated-rate income tax. Each is shown in the Table.

Table

Methods of Treating Couples versus Single Individuals under an Income Tax

Rate Schedule for Methods A, B and C:

Taxable Income	Marginal Rate
0–$10,000	10%
over 10,000	20%

	Mr. & Mrs. Jones			Mr. & Mrs. Smith			Miss Williams
Taxable Income	Mr. $10,000	Mrs. $10,000	Total $20,000	Mr. $20,000	Mrs. $00,000	Total $20,000	Total $20,000
Methods of Taxation							
A. Tax total income of tax paying unit TAX	---------	---------	3,000	---------	---------	3,000	3,000
B. Tax each individual separately TAX	1,000	1,000	2,000	3,000	0	3,000	3,000
C. Tax couples as if income were earned equally (income splitting) TAX	1,000	1,000	2,000	1,000	1,000	2,000	3,000
D.[a] Actual treatment under Federal Personal Income Tax (1984 rates) TAX			2,268			2,466	3,212
E. Flat rate tax (15%) TAX			3,000			3,000	3,000

[a] It is assumed here that the Joneses and Smiths both have total gross incomes of $22,000: $11,000 for each Mr. and Mrs. Jones and the entire $22,000 for Mr. Smith. Miss Williams is assumed to have a gross income of $21,000. Thus, after exemptions, each of the three taxpaying units would have a "taxable" income of $20,000 if there were no deduction for two-worker couples. This deduction for the Joneses ($11,000×.10=$1,100) is treated as an adjustment to gross income.

Under Method A, each household is taxed on its total $20,000 taxable income. With equal total incomes, each of the three households pays $3,000 in taxes (.10×$10,000+.20×10,000). This seems fair at first glance, but there is at least one important problem. Suppose the Joneses were not married. In this case, each would be taxed separately on their $10,000 income and with our two-bracket income tax, $10,000 lies solely in the 10 percent bracket. Thus, each would pay taxes of $1,000, for a total of $2,000. Upon marriage, their bliss may be reduced when they find that, with a combined income of $20,000, half is taxed at 10 percent and half at 20 percent, making for total taxes of $3,000. Thus, marriage increases their total income taxes by $1,000, which many people would argue is unfair.

Method B in the Table would eliminate the "marriage penalty" by taxing each person separately on his or her own income. This method was used in the United States before 1948, and some advocate its return. In the example, the Smiths and Miss Williams would pay the same amount of tax as with Method A, but for the Joneses, the two-wage-earner couple, each of their $10,000 incomes would be taxed solely in the 10 percent bracket, making their total tax $2,000 rather than $3,000. Since each person is taxed separately, the Jones — if they had been single — would not be penalized for getting married. Their total tax would be $2,000, married or single. This method then would be "marriage neutral." But note with this plan, although the Joneses and Smiths have equal $20,000 taxable incomes, the Joneses pay only $2,000 in total income tax while the Smiths pay $3,000.

Some argue that it is justifiable to tax couples heavier if there is only one working spouse because such families have lower expenses for childcare, housecleaning, commuting, restaurant meals, and other outlays associated with working. But it would seem rather arbitrary to make a distinction for such differences through diffences in tax rates. Such an approach cannot account for actual dollars spent. And, of course, the nonworking spouse may be involved in volunteer or other activities making it desirable to pay someone for housecleaning, and so on. Moreover, in this example Miss Williams would pay the same amount of tax as Mr. and Mrs. Smith, and the former, with no spouse to help, could well have to pay for housecleaning, childcare, and so on.

A third basic possibility is Method C, where for tax purposes income is split equally between spouses for married couples. Here the Smiths would be taxed as though Mrs. Smith earned half the couple's income even though Mr. Smith actually earned it all. This method, of course, would make the Smiths and Joneses pay equal taxes on their equal combined incomes. In this example, under Method C each spouse for the two couples in effect pays taxes on $10,000, which is taxed entirely in the 10 percent bracket. This brings total taxes of $2,000 for each couple. This seems fair so far. But look at poor Miss Williams. She has no one with whom to split her income and, thus, continues to have half of her $20,000 taxed at 10 percent and the other half at 20 percent, bringing a total tax of $3,000. The inequity between couples has been eliminated, but now we have a "singles penalty" with Miss Williams paying $1,000 more income tax than the Smiths or Joneses even though all three households have equal taxable incomes.

As noted, the US practice until 1948 was Method B, where each person was taxed separately on his or her own income. Court rulings held, however, that in states with "community property" laws, couples could split their incomes for tax purposes. Rather than see many states overhaul their property laws solely for federal income tax reasons, Congress decided to make "income splitting" available to couples in all states. Thus, Method C in the Table was instituted in 1948. As shown in the example, this resulted in much higher taxes for a single person than for a married couple with the same taxable income.

To reduce this "singles penalty," Congress instituted in 1969 a change such that married couples still split their incomes for tax purposes, but singles are taxed under a separate rate schedule. This schedule reduces, but does not eliminate, the " singles penalty." Introduction of the separate rate schedule for single taxpayers, however, introduced a "marriage penalty," in that if two persons both earn income before marriage, their total taxes may rise upon marriage. As noted this "marriage penalty" was reduced by the latest change which allows the spouse with the lower income to deduct 10 percent of gross income if both work.

In the Table, Method D shows the actual treatment of the three households under the federal personal income tax. Now each of the three households pays a different amount of tax.[1] Miss Williams pays most — $3,312 or $944 more than the Joneses and $746 more than the Smiths — because she is not married. The Smiths pay $198 more than the Joneses because only Mr. Smith works, and thus the couple is not eligible for the two-working-spouse deduction. If Mr. and Mrs. Jones had not been married, each would pay taxes of $1,079 for a combined total of $2,158. Upon marriage, their taxes would increase to $2,268, for a "marriage penalty" of $111.[2]

Our present treatment of married couples versus single persons thus has some element of each of the three basic methods — A,B, and C in the Table. This combination results in a " marriage penalty" (similar to what occurs in Method A in the Table), a "singles penalty" (Method C), and with the most recent change, we now have a "one-working-spouse penalty" (as occurred in Method B). Perhaps the Reagan administration and Congress felt that by spreading the "penalties" around, equity would be improved over what it otherwise would be if we had only a "singles penalty" or only a "marriage penalty," but the fact remains that households with the same or similar incomes now pay significantly different amounts of federal income tax depending upon their marital status and how the income is actually earned by the two spouses. Moreover, although fairness or equity is a matter of opinion, it seems convincing to argue that based on the three basic methods in the Table and their equity problems, there is no fair solution to the problem under a graduated-rate income tax.

Suppose we had a flat rate income tax of say 15 percent. In the Table, Method E indicates the results. Each household would pay $3,000 in taxes. Both the Joneses and Smiths would have paid the same total taxes whether they were married or not. With only one bracket, the combining or splitting of income cannot place a household in a different bracket. Thus, there is no "marriage penalty." And, likewise since the income of all households — married and single persons alike — would be taxed at the same rate, there would be no "singles penalty." Finally, since the "marriage penalty" would be eliminated, there would be no reason to allow a special deduction for couples where both work, and therefore there would be no "one-working-spouse" penalty. Households with equal taxable incomes would pay equal taxes.

A flat rate tax then is neutral with respect to marital status and division of income between husband and wife. The horizontal equity problem of fair tax treatment of single individuals versus married couples, a problem which is inherent in, and seemingly unsolveable under, a graduated-rate income tax, does not arise with a flat rate tax.

In closing it should be noted that none of the proposals currently before Congress would solve the problem of fair treatment of single persons versus married couples. The reason is that none of the "flat tax" proposals is actually a flat tax. They all have two or three brackets. Therefore, they would probably reduce the severity of the singles versus couples problem as well as other horizontal equity problems, but they would not solve them. Only with a true flat rate tax with one bracket would these horizontal equity problems be eliminated.

Notes

[1] In this method both the Joneses and Smiths are assumed to have a gross income of $22,000, with Miss Williams' assumed to be $21,000. See footnote in the Table.

[2] In the case of the Smiths where only one spouse works, marriage significantly reduces total taxes, assuming only one of the two worked before marriage. If he were not married, Mr. Smith's $22,000 gross income would bring a tax of $3,472. Marriage brings a second exemption and allows Mr. Smith's income in effect to be split between him and Mrs. Smith, resulting in income tax of $2,466, $1,006 less than before their marriage.

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Exports: An Integral Part of the Illinois Economy

Carolyn Woj

Exports are an integral component of the US and Illinois economies. In 1981 the United States was the world's largest exporter. Illinois ranked third among the states in the export of manufactured goods and first in the export of agricultural products.

Exports generate considerable employment. In addition to the jobs necessary to produce the goods exported, jobs are created in the services and industries that supply the export industries (see Table 1). It is estimated that approximately 25,000 jobs are generated per billion of US merchandise exports. In Illinois it is estimated that approximately one out of every eight manufacturing jobs in the state is export related. In addition, nearly one-half of Illinois agricultural sales is export related. Clearly, a healthy export market is essential to the well-being of the Illinois economy.

Table 1

United States Manufactured Exports by State

State	Rank as Exporter in 1981	Export Value (millions) 1969	1972	1977	1981	% Increase from 1977 to 1981	Estimated Exports as % of State Production	Employment Related to Exports as % of State Employment
US, total	—	$29,210	$36,608	$85,796	$164,283	91	8.1	7.3
California	1	2,721	2,809	9,116	18,775	106	9.8	9.7
Texas	2	1,468	1,982	5,386	11,687	117	6.5	7.2
Illinois	3	2,343	2,902	6,313	10,369	64	8.2	6.9
Ohio	4	2,338	3,054	6,028	10,353	72	8.5	7.9
Michigan	5	2,613	3,522	6,937	10,275	48	9.8	7.6
New York	6	2,296	2,795	5,833	10,155	74	8.5	6.5
Washington	7	954	1,781	2,805	9,023	222	24.5	21.9
Pennsylvania	8	1,902	2,351	4,714	8,129	72	7.1	6.9
Massachusetts	9	818	920	2,310	5,096	121	10.6	8.6
Indiana	10	998	1,404	2,942	5,008	70	7.1	7.0

In recent years the ability of the United States and Illinois to export their products has declined. Following the record level of exports in 1981 (see Table 2), exports decreased in 1982 and 1983. In 1984 exports rose by 8.7 percent, only to be dwarfed by a 26.4 percent increase in imports. 1983 was the first year in which the United States experienced a trade deficit ($57.6 billion). By 1984 the trade deficit had climbed to $123 billion. There is a projected $150 billion deficit for 1985.

The impact of the decline in exports on the Illinois economy is the focus of this article. Recent developments leading to the decline, and the initiatives taken by Illinois lawmakers and business to stimulate the economy will be discussed.

Illinois Exports

Table 3 shows the growth in Illinois exports for the state's 10 leading industries. Illinois has maintained its position as third among the states in the export of manufactured goods from 1969 to 1981. Overall Illinois manufactured exports increased 64 percent from 1977 to 1981, compared to a 36 percent increase in total manufactured goods output. Among manufactured goods, nonelectrical machinery was Illinois' leading export. It accounted for nearly one-half of the total manufactured exports in 1981, and led the nation in terms of exports in this category. Food products and electric/electronic equipment were the second and third leading exports in the state, with sales of $1.2 billion and $1.1 billion, respectively.

Illinois has also been first over the years in the export of agricultural products. The value of exports in the state totalled $3.3 billion in 1982, a 30 percent increase from the 1977 level. Soybeans and products and feed grains and products accounted for the majority of exports. Illinois was first in the nation for exports of these goods. With one of every two dollars of Illinois farm sales export related, this sector of the state's economy is extremely dependent on exports for its continued well-being.

In terms of employment, Illinois is more dependent on exports than is the rest of the nation. Of the civilian labor force, 5.4 percent was directly or indirectly involved in the export of manufactured products in 1981, compared with 4.7 percent for the nation. As Table 4 indicates, percent of total manufacturing employment in the state was directly related to exports. The nonelectrical machinery, electric/

Table 2

United States Agricultural Exports by State

			Export Value (millions)				
State	Ranks as Exporter FY 1982	FY 1968	FY 1977	FY 1982	FY 1982	% Increase FY 1977 to FY 1982	Exports as % of Farm Sales
US, total	—	$6,315	$8,050	$24,013	$39,094	63	27.5
Illinois	1	585	758	2,539	3,306	30	43.3
Iowa	2	392	620	2,042	3,026	48	28.9
California	3	413	592	1,774	2,854	61	20.6
Texas	4	551	456	1,761	2,569	46	25.4
Minnesota	5	226	347	918	1,883	105	29.4
Nebraska	6	230	283	988	1,808	83	26.4
Kansas	7	296	365	998	1,628	63	29.3
Indiana	8	252	384	1,319	1,559	18	36.6
Missouri	9	174	317	766	1,404	83	34.4
North Dakota	10	166	250	554	1,326	149	50.7

Table 3

Illinois Growth in Manufactured Exports

	Export Value (millions)					% Increase from 1977 to 1981		Export Increase as % of Production Increase 1977-81
Industry Group	1960	1969	1972	1977	1981	Exports	Production	
Total	$1,216	$2,343	$2,902	$6,313	$10,369	64	36	12
Machinery, except electric	576	1,033	1,263	2,892	5,160	78	41	37
Food and kindred products	141	177	375	736	1,170	59	41	37
Electric and electronic equipment	98	300	321	532	1,170	59	23	13
Chemicals and allied products	60	140	145	407	707	74	46	9
Transportation equipment	129	131	173	461	487	6	13	4
Instruments and related products	37	118	112	254	396	56	17	41
Fabricated metal products	44	135	146	323	363	12	23	2
Misc. manufacturing industries	39	76	(1)	174	297	71	52	16
Primary metal industries	35	94	78	186	263	42	22	4
Rubber and plastic products	12	28	37	74	138	87	34	7

electronic equipment, and fabricated metal industries accounted for over one-half of all the employment related to manufactured exports. One of every four jobs in the nonelectrical machinery industry was export related.

Recent Developments in Exports

The trade deficit is growing despite a modest increase in exports. Although exports increased last year, the rise in imports was nearly three times greater. The Illinois economy has been hit hard by the growing trade deficit. Caterpillar Tractor Company of Peoria is one case in point. Faced with a declining demand for its product, Caterpillar has been forced to cut capacity and employment. It recently announced plans to reduce operations at six of its seven major US manufacturing plants. Five of the six plants are located in Illinois.

The price of a US dollar, when paid for in foreign currencies, has risen over the last three years. This situation is referred to as a strong dollar and is the most often cited reason for the decline in exports. It has risen approximately 60 percent relative to other currencies over the last five years. The high value of the dollar makes US goods more expensive relative to those of other countries.

The experience described by George Kennedy, President of an Illinois minerals and chemicals firm is typical. According to Kennedy, the prices of the company's products have risen when paid for in foreign currency. A product that cost a French customer 1,020 francs in 1980 had risen to 1,594 francs by last year. The price increase has trimmed profit margins. In addition, Kennedy asserts that the higher relative price of American products is causing customers to choose products from other countries. "If you sum this up, this is either a marvelous foreign aid program with which we help our offshore trading partners by conceding markets, or else we're losing sales and profits and jobs for no good reason."

The high value of the dollar is not the sole factor behind the US export crisis. Other factors cited by experts include trade barriers abroad, export restrictions for supposedly sensitive equipment, faster economic growth in the US than abroad, and a decrease in US companies' competitiveness abroad.

A recent study of US agricultural exports from 1971 to 1983 found that the real income of importing nations, rather than the value of the dollar, was the most important determinant of the level of exports. The study, completed by Batten and Belongia of the St. Louis Federal Reserve Bank, also found that the largest decline in agricultural exports occurred in 1982, the year of the worldwide recession. "Moreover, since 1982, real agricultural exports have increased even though the dollar has continued to appreciate (by over 15 percent) in foreign-exchange markets."

In addition, differences in quality of goods across countries have an impact on their ability to export. High technology industries, such as computers, did well on the export market. Computer exports rose approximately 18 percent in 1984. In the area of high tech goods, quality differences are important. In contrast, agricultural goods are relatively homogeneous. Wheat from Argentina and wheat from this country are virtually indistinguishable.

Illinois Initiatives

The Illinois Department of Commerce and Community Affairs (DCCA) has taken a number of steps to strengthen Illinois' position as an exporter. DCCA has trade offices in Hong Kong, Japan, Belgium, and Brazil whose purpose it is to promote Illinois products. These offices sponsor distributor searches, catalog shows, and trade shows in foreign countries. One recent trade show in Mexico City netted 26 contracts with potential distributors and joint venture partners. According to their Overseas Bureau Report, "Thus far, 1,075 firms have participated in 21 separate programs that have been held in 73 cities. These promotions generated 10,834 trade leads, or an average of 10 per participating company.

The DCCA also publishes an Illinois Business Services Directory, which lists services and organizations that assist Illinois exporters. Some of the organizations listed in this publication are export sales groups, international banks and lawyers, and foreign freight forwarders. In addition, the DCCA has re-

Table 4

Annual Exports and Employment Related to Manufactured Exports

	Manufactured Exports (millions)	Manufacturing (1,000s)	Employment %	Total Employment (1,000s)	Total Employment Civilian %
Illinois[a]					
1976	$6,660	156.9	12.5	240.4	5.1
1977	6,313	140.1	10.9	220.9	4.5
1980	10,084	164.7	12.9	285.0	5.5
1981	10,369	157.0	12.9	275.4	5.4
United States					
1976	83,098	2,125.4	11.3	3,452.1	4.0
1977	85,796	1,990.2	10.2	3,258.2	3.6
1980	151,216	2,639.3	12.8	4,808.3	4.8
1981	154,283	2,603.8	12.8	4,794.0	4.7

[a] Illinois export-related manufactures were as follows in millions of dollars: 1976, 10,433; 1977, 10,216; 1980, 16,455; and 1981, 17,039. About 20 percent of the increase in Illinois manufacturing production from 1977 to 1981 was generated by growth in export-related manufactures.

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cently published a Directory of Illinois Exporters. According to the introduction, the "Directory contains a listing of manufactured products offered for sale by Illinois firms. It is not a comprehensive listing of all manufacturing firms in the state, but includes those companies that have expressed an interest in expanding their overseas sales."

DCCA has thus undertaken a number of initiatives designed to aid Illinois exporters. The future of Illinois exporters and, hence, the Illinois economy is uncertain, since it depends to a large extent on the actions taken at a national level. The value of the dollar is not a policy tool of DCCA. This group has, however, undertaken a number of programs designed to aid Illinois exporting firms and the Illinois economy through the present export crisis.

ILLINOIS BUSINESS INDEXES

	Percent Change July 1984-July 1985	July 1985	June 1985	May 1985	April 1985	July 1984	June 1984
Coincident Indicator (1969=100)	9.98%	122.39	122.80	123.96	122.29	111.28	111.33
Employment-manufacturing (in thousands)[e]	-4.12%	946.9	959.4	953.6	953.3	987.6	998.5
Average weekly hours-manufacturing[e]	0.25%	40.7	40.7	40.2	40.3	40.6	41.1
Weekly earnings-manufacturing[e]	4.03%	$425.32	$423.28	$416.07	$416.30	$408.84	$412.23
Help wanted advertising-Chicago (1969=100)[a]	-3.81%	101	99	96	94	105	101
Help wanted advertising-St. Louis (1969=100)[a]	8.06%	67	73	64	64	62	69
Retail Sales (in millions)[b]	-0.59%	$4,919	$5,305	$5,623	$5,283	$4,948	$5,038
Coal production (in thousands)	-16.45%	4,270	4,750	6,147	5,196	5,111	5,560
Petroleum products (in thousands)[e]	2.23%	2,525	2,445	2,430	2,593	2,470	2,352
Vendor performance	-26.67%	44.0%	44.0%	44.0%	44.0%	60.0%	66.0%
Building permits (in thousands)							
Residential housing units	27.81%	4.440	4.012	4.716	3.723	3.474	3.524
Value of Residential housing	35.02%	$247,850	$223,064	$253,833	$212,888	$183,564	$195,876
Value of nonresidential construction							
Industrial buildings	19.22%	$34,493	$28,321	$34,445	$20,462	$28,933	$15,453
Office, banks, and professional buildings	294.57%	$119,121	$22,439	$31,949	$63,386	$30,190	$33,893
Stores and other mercantile buildings	20.71%	$31,400	$17,680	$32,014	$29,503	$26,013	$20,959
Other	47.92%	$5,075	$6,273	$6,264	$2,427	$3,431	$3,591
Consumer price index (December 1977=100)							
North Central US[c]	3.38%	–	174.2	–	172.8	–	168.5
North Central/population more than 1,250,000[c]	3.68%		177.6	–	175.9	–	171.3
North Central/population 385,000 to 1,250,000[c]	2.92%	–	172.6	–	171.7	–	167.7
North Central/population 75,000 to 385,000[c]	2.98%	–	169.6	–	168.6	–	164.7
North Central/population less than 75,000[c]	3.40%	–	170.4	–	169.1	–	164.8
Chicago (1967=100)	4.38%	324.4	324.1	319.8	319.1	310.8	310.0
St. Louis (1967=100)	4.75%	319.9	–	315.9	–	305.4	–
		1985:I	1984:IV	1984:III	1984:II	1984:I	1983:IV
Personal income (in millions)[d,e]	7.77%	$164,894	$162,200	$160,180	$156,710	$153,010	$147,360
Per capita personal income[d,e]	6.43%	$14,148	$14,024	$13,871	$13,593	$13,293	$12,812

[a] The Conference Board, *Help Wanted Advertising*, May 1985. [b] Latest month projected by BEBR. [c] Percent change between June 1984 and June 1985. [d] Percent change between 1984:I and 1985:I. [e] Recent month is preliminary figure.

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Small Business and the Taxation of Fringe Benefits

Robert W. Resek and David Lee

The government is going through a major program of revisions of the entire federal tax system, and some proposals for reform are likely to have a significant effect on our business system. At present, many fringe benefits are not included as taxable income when they are paid directly by the employer. Some of the recent tax proposals would significantly alter this tax treatment, and we hope to provide some insight into the gains and losses from these proposed changes.

Fairness

How do we judge fairness? Fairness implies that all workers with similar economic circumstances receive the same tax treatment regardless of the specific characteristics of the firm or industry in which they are employed. One factor that should have no impact on tax liability is the size of the firm. The government should not bias its laws either for or against small business. Each firm regardless of size should have the opportunity to compete on an equal basis with its rivals, and all workers should have equal treatment under the law.

Another factor is the industry group of the firm. Different industries have grown up under different economic conditions and have developed different patterns of fringe benefits and other traditions. Equitable and efficient tax laws should not favor one particular set of institutional arrangements over another.

Finally, unions are an important element in our work place. They have been and will continue to be an important factor for many workers and many industries. Any proposed changes to the tax code should insure equal treatment for workers in firms or industries whether or not they are unionized. Clearly, other factors do affect the equitable level of taxes. We believe in differential taxes for people in different income classes, and we will attempt to maintain in our analysis the progressive structure of the current law.

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Efficiency

The tax structure should aid the economic system to work efficiently. The tried and true lessons of the American system, and of economic theory, tell us that the price system helps the society allocate resources such as land and labor to the uses where they do the most to help society. The government should only intervene where monopoly, controls, or external effects alter the ability of the economic system to perform. On the other hand, actions of the government should not be the cause of a change in the relative prices that workers or companies pay for goods and services in markets where there is no impediment to the price system. The inability of the Soviet Union to get its economy moving is very much related to the inability of a planned economy to allocate efficiently the available resources. We should insure that we do not undertake government actions that reduce the economic performance of our nation.

This emphasis on efficiency is particularly relevant in discussions of small business. Our small businesses are a major force in the betterment of our society, and their ability to succeed depends on their ability to compete fairly. Therefore, our analysis will seek a tax system that does not alter the basic competitive forces that enable small business to succeed.

Simplicity

The current tax system has received a great deal of criticism, in part because it is difficult for many people to comprehend. Therefore, it is desirable to achieve a tax system that is as uncomplicated as possible, for with this will come increased understanding, compliance, and support. While simplicity is desirable, we feel it is less important than fairness and efficiency.

Constant Revenue

How do we analyze this problem while avoiding questions of revenue gain or loss? We will consider changes in the specific treatment of fringe benefits but will accompany each change in our analysis by a simultaneous change in the rate structure so that the total amount of taxes collected will remain the same. For example, an increase in possible deductions will reduce taxable income, and therefore, reduce revenue. To maintain constant revenue, we must have a parallel increase in the tax rates on that class of taxpayers. Similarly, a decrease in possible deductions will be considered together with a reduction in tax rates.

Importance of Plans

A very large fraction of workers are covered by some type of fringe benefit plan. Chart 1 shows the number of employees covered by health care benefits. In 1983 over 63 million employees had part or all of their health care benefits paid by their employer or union. Moreover, Chart 2 shows that the total employer contributions to group health and life plans in 1982 totalled 73 billion dollars. The magnitude of these plans both to the individual workers and to the areas of our economy that receives these funds are exceedingly important.

Coverage differs greatly from firm to firm. Chart 3 shows the percent of employees in group health plans by type of firm, size of firm, and by the union or nonunion status of the workers. These statistics were chosen because they are reliable and readily available.

First, we note that unionized firms on the average have more benefits. This to some degree shows the effectiveness of the union leaders in bargaining on behalf of the workers. In fact, 91 percent of workers covered by a union contract have health insurance against just 67 percent of workers without that contract.

Next, workers in large firms are much more likely to be covered by health benefits than those in small firms. Indeed, 94 percent of workers in firms with more than 500 employees are covered whereas only 62 percent in firms with fewer than 100 employees receive those benefits.

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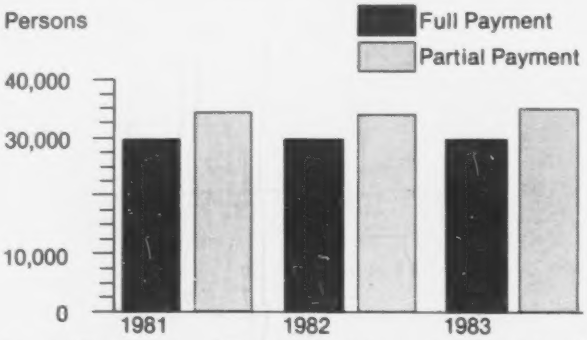
Chart 1

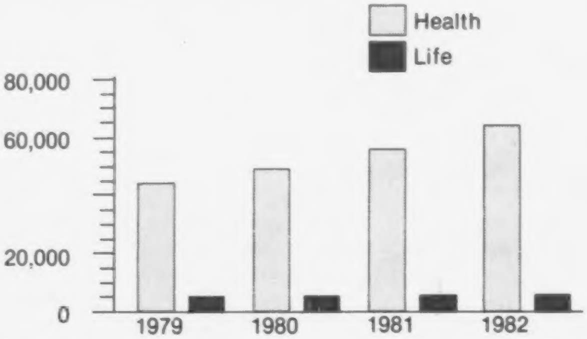
Employees with Employer- or Union-Provided Health Care Benefits



Source: "Characteristics of Households and Persons Receiving Selected Noncash Benefits: 1983," Table 17, *Current Population Reports*, Series P-60, No. 148, US Department of Commerce, Bureau of the Census, 1985.

Chart 2

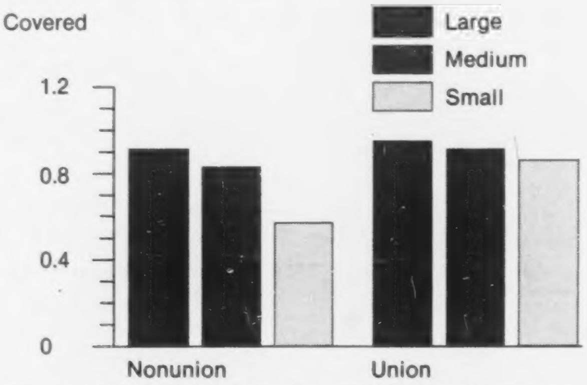
Employer Contributions to Group Health and Life Plans



Source: National Income and Product Accounts of the US, Table 6.15, *Survey of Current Business*, US Department of Commerce, Bureau of Economic Analysis.

Chart 3

Group Health Benefit Coverage (percent of employees by firm size)



Source: "Health Benefits: Loss Due to Unemployment," US Senate Committee on Unemployment," April 1983. p. 3.

Analysis

Many types of fringe benefits exist, ranging from medical insurance to life insurance, stock options, and cafeteria plans. We do not intend to consider the relative merits of each of these plans. Instead, we will consider benefits as a whole.

Our analysis is also illustrative rather than statistically representative of every detail of either fringe benefits or the current or proposed tax system. The numbers we give are taken to represent the implications of the tax system fairly. There will be specific characteristics of the tax plan that may alter the exact numbers — but they will not alter the character and implications of the results.

We will examine the tax system for two hypothetical workers, one covered by fringes and one not. The worker who works in a firm providing fringe benefits earns $25,000 per year and has a benefit package to which his employer contributes $900 per year. We assume he has exemptions of $2,000 and pays taxes on $23,000. Under the proposed tax system, he is in the 25 percent bracket and pays a total tax of $3,515. His annual income, less taxes, is $21,485, while the value of his pay plus fringes is $22,385. This is the true value of the job to this person.

Our worker with no fringe benefits receives the same total value of pay and benefits as the worker with benefits, but it is all in wages or salaries. Therefore, his pretax income is $25,900 per year. Using the same deduction, his taxable income is $23,900 from which $3,740 in taxes are paid in the 25 percent bracket, leaving a disposable income of $22,160.

It is clear that the two firms have the same total employment cost for these two workers. Yet, the worker without the fringe benefit package receives $225 less purchasing power per year than does the worker in the firm with the benefits. This is clearly unfair both to the uncovered worker and to the firm that pays him.

Costs and Benefits of the Fringe Plans

Firms pay fringe benefits in part because the workers prefer fringes. But even more, it is because the use of fringe benefits allows the firm to gain an advantage over firms that do not use these plans. The advantage arises from the fact that the nontaxable fringe benefits provide a subsidy to workers who receive them. But the gain is not free. The net subsidy is a transfer from the workers who are not covered by fringe benefits to those that are.

Do these benefits have an impact on the ability of our economy to perform well? The answer is clear. The firms that include fringe benefits as part of their employee compensation packages get the same worker for less net cost than those that do not pay fringe benefits. Recognizing a higher real return on their labor efforts, workers will transfer from the firms without coverage, say the small entrepreneurial firms, to the firms that do have coverage. These firms, which are, on the average, larger, have an unfair advantage in the market for workers that results in a competitive advantage in the final product market.

What social benefits might accrue from the utilization of fringe benefits as part of an employees total compensation? Clearly, we can argue that health care is important to society. We may choose to have a way to subsidize the health care in order that all people in our society are assured of good care. Similarly, we may decide to subsidize life insurance plans or stock option plans for employees.

Economic theory suggests that these subsidies should be made on their own merits and not hidden in some alternative plans. Subsidies to health plans should be as a direct tax credit for a fixed amount of health expense. A subsidy in this form would allow people to purchase a health plan of their own choice for at least the amount of the credit. In addition, a tax credit has an equal effect across all income levels as opposed to a deduction that favors those with higher income.

Economics also tells us that all people should pay the real marginal (additional) costs of their health care. If they pay the difference between a fixed insurance contribution and the actual cost, they will be more likely to choose economically efficient health-care providers. The health care industry will be forced to act competitively and to demonstrate the benefits it provides policy holders. If a consumer does not pay the last dollar of the insurance plan either directly or through his deduction, then he will not be careful to make sure that the plan is spending the funds wisely.

Who gains from the deduction of fringe benefits? The greatest gains by the firms that offer fringe benefit plans, because their true labor costs are lowered. Second, the covered workers benefit, for they receive health insurance at a price below its true social cost. Furthermore, labor unions realize a very large benefit from the deductions. Since their membership is largely covered, union workers receive the economic advantages while workers in nonunion industries are losers. This is an unfair bias in favor of the unions.

Lastly, the health care industry and insurance industry both benefit greatly. Economics tells us that different commodities should not be subsidized. Yet health and life insurance under these employee fringe benefit plans are paid in part by the government. This subsidy lowers the price of these services and causes workers to buy more health and life insurance than they would if the deduction did not exist. While insurance is an important commodity, it is not clearly preferable for this money to be spent on insurance rather than on clothes or education for the worker's family or on other goods. If this deduction is removed, the effective price of insurance will rise to its true value, and the large insurance industry in the United States will lose business over a number of years and will have to compete more intensively for the business it gets.

Proposed Changes

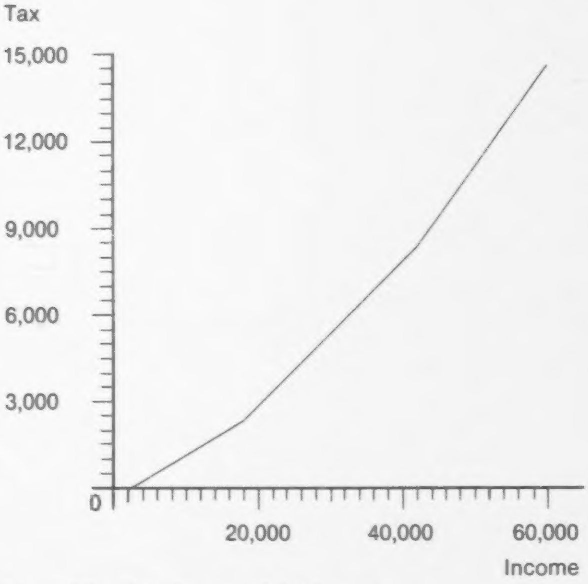
We can see that there are real elements of unfairness and inefficiency in the current deduction of fringe benefits from taxes. We feel that better tax laws would do away with the deduction for fringe benefits and give the tax revenue gains directly back to the class of individuals from which the revenue was generated. That is, the revenue increase realized from workers earning around $25,000 should be directly returned to workers in that income group. The only change is that income from workers employed in firms without fringe benefits would have the same positive tax benefits as those from firms that do pay fringe benefits.

In our example, after the deduction is removed, the total tax collected rises by $165. We must now give this revenue back to the taxpayers. Our proposal reduces the marginal rate in the first tax bracket from 15 percent to 13.9 percent. Chart 4 shows the tax rates and tax levels under the government proposal. Chart 5 presents the same information and adds one line showing the lower tax rates for all taxpayers. Under our proposal, the taxes of workers with fringes would rise because, in fairness, fringe income is included in the tax base, which has been the case of the worker from the small firm all along. Our calculations show that the tax of the worker with fringes rises from $3,515 to $3,573, or an increase of $58. The real difference is to the worker not receiving fringe benefits. His tax liability would fall from $3,740 to $3,573 or a reduction of $167 (see Chart 6).

The Treasury Department has presented two specific proposals to bring about more equity and efficiency. Under the first proposal (Treasury 1), there would be a cap on the maximum amount of employer-provided health insurance that is free of taxation. The amount free of tax would be $70 per person per month or $175 per family per month. According to the Treasury Department, "the proposed limits would have no effect on approximately 70 percent of all employees because the limits exceed their employers' contributions." On the other hand, Treasury 2 provides for an initial amount of employer-paid health insurance that is subject to tax with subsequent amounts to be tax-free (a fringe benefit floor). The taxable amount is $10 per month per person or $25 per month per family. Since almost 90 percent of all employees receive employer-paid health insurance benefits, all of these individuals would be subject to the tax.

Chart 4

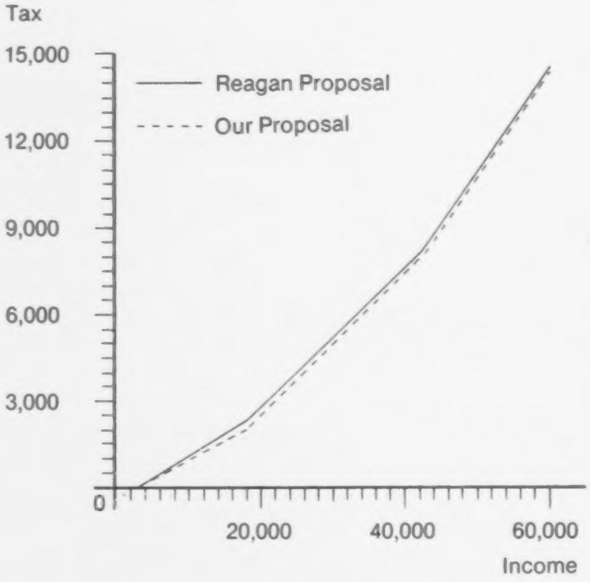
Tax Liability



Source: Office of the Secretary of the Treasury.

Chart 5

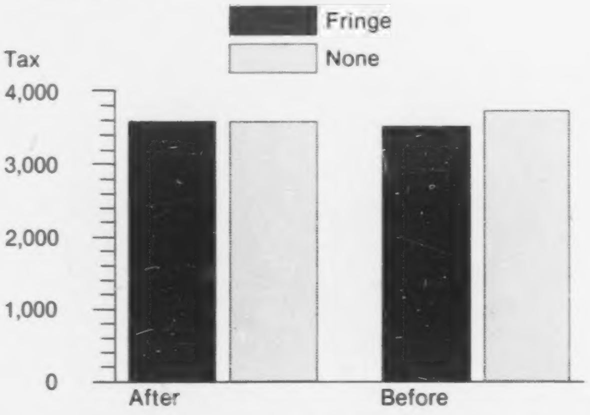
Tax Liability



Source: Office of the Secretary of the Treasury; Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign.

Chart 6

Tax Effects of Fringe Benefits



Source: Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign.

In comparing these two plans, we conclude that the Treasury 1 proposal is superior to that of Treasury 2 for a number of reasons. First, Treasury 2 does not compel the consumer to pay for the last dollar of benefits. As we mentioned earlier, this will not result in an efficient operation of the market system. Second, Treasury 2 is, in effect, a tax on all holders of fringe benefits since the average benefit received by families is approximately $125.00 per month. Finally, Treasury 2 offers no incentive to slow down the substitution between wage income and fringe benefit income. As we have demonstrated, this will result in inefficiency and inequity between those that do and do not receive fringe benefits.

To resolve these problems, we suggest some alterations that could be made to the Treasury 2 plan to make it more efficient. Specifically, we suggest a fringe benefit cap, as in Treasury 1, but one that results in the same tax revenue as under Treasury 2. Such a plan would require a cap of $100.00 for individuals and $250.00 per family per month and would be approximately revenue neutral. Moreover, it would provide the proper incentives for equity, efficiency, and fairness in the taxation of employer-provided fringe benefit contributions (see the Table).

Table

Limits of Taxation	Treasury 1	Treasury 2	Our Proposal
Per Person	$ 70	$175	$100
Per Family	10	25	250
Revenue*			
1986	–	2.4	–
1987	4.6	3.5	1.7
1988	8.0	3.7	2.9
1989	9.8	3.8	3.5
1990	11.9	4.0	4.0

*In billions. The revenue projections are based on earlier data than now available and are about 20 percent too high according to a Treasury Department researcher. All proposals indicated here are indexed by the CPI.

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REAL ESTATE DEVELOPMENTS

Hedging Mortgage Portfolios with Options on Futures

David W. Marshall and Peter F. Colwell

Savings and loan associations historically have been able to finance portfolios of long-term, fixed-interest-rate, mortgage loans with short-term deposits. As long as long-term rates were above short-term rates and the general level of interest rates were relatively stable, this type of operation was highly successful. However, starting in the 1960s borrowing short and lending long created serious financial difficulties for savings and loan associations (S&Ls). One problem was the general upward trend in the levels of all interest rates. This forced the S&Ls to pay ever higher rates of interest on their deposits while continuing to receive constant rates on their long-term loans. If an S&L tried to liquidate its long-term loans by selling them, capital losses would result. This happens because the S&L no longer has as valuable an asset, that is, it owns a long-term loan that earns below market rates of interest. Investors would not be willing to pay face value for such a loan. The S&L loses whether it chooses to keep the loan or sell it.

Until relatively recently, there was little the S&Ls could do to combat the problem of a yield curve that "shifts" up or down. Within the last few years S&Ls have been better able to match the maturities of assets and of liabilities in part because they are now allowed to originate and purchase variable-rate mortgages (that is, essentially short-term assets) and in part because they can have medium-term liabilities like certificates of deposit.

Does this mean the S&Ls should only issue variable-rate mortgages in order to protect themselves from getting caught in another interest rate escalation? With the public's continuing demand for fixed-rate mortgages and with the higher default risk of adjustable-rate mortgages, S&Ls would like to be able to issue fixed-rate mortgages, but only if they can protect themselves from fluctuations in yields. There are methods to protect the S&Ls' long-term portfolio from declining in value due to increasing interest rates. One of these is hedging in the futures market. When an S&L hedges, the overall goal is not to turn a profit or loss by declining or rising interest rates, but rather, to maintain a given position of value. There are some disadvantages to dealing directly in the futures market, however, some of which are eliminated through new trading instruments: options on futures.

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This article explains how an S&L can use options on futures in order to maintain their portfolio value. This approach may give S&Ls flexibility in issuing either variable-rate or fixed-rate loans. While the costs of information and expertise may keep most individuals from doing this themselves, an industry might arise to insure individuals who have variable-rate mortgages from interest-rate risk.

The Futures Market

The largest futures market in a long-term financial instrument is the Chicago Board of Trade's US Treasury Bond futures market. Using the futures market, an S&L can protect its portfolio using an appropriate hedge ratio. The hedge ratio can be determined by calculating the ratio of the average change in mortgage values to the average change in futures contract prices. The appropriate number of futures contracts could then be sold (shorted). The costs involved in trading futures contracts make it relatively affordable. There are three types of explicit cost: commissions, margin, and cash-flow costs arising from the "marked-to-market" procedure. Commissions on futures market transactions are low, amounting to less than $50 per contract for a round trip (buying and selling) transaction. A margin deposit is required when a position is opened. The margin is usually between $1,500 and $2,000 per contract (an interest-earning asset could be substituted). A third cost, which can be more difficult to deal with, is the "marked-to-market" procedure. Under this procedure, profits and losses resulting from daily changes in prices of the contracts are actually realized by those who have a position in the contract.

However, there is one substantial problem that makes attempts to hedge in this futures market very difficult for an S&L: prepayments. As interest rates fall, the value of the mortgage portfolio will rise. At the same time, the futures position will decline in value offsetting the gain in the portfolio. But, as rates fall, consumers will begin to prepay their mortgages and take out new mortgages at the then current lower rates. Therefore, the mortgage portfolio is not increasing in value for the institution. The net result is a loss in the futures market without a corresponding gain in the portfolio of mortgages. Therefore, institutions are able to protect themselves from rising interest rates but not from losses during periods of declining interest rates. This makes the futures market an unreliable vehicle for hedging portfolios of mortgages.

Options on Futures Contracts

The recent approval of options on futures contracts have created new opportunities for S&Ls. Several of the problems that plagued the institutions trying to hedge with futures contracts are overcome by the use of options.

The problem created through the prepayment of mortgages as interest rates fall is a serious one for hedging institutions. Options only offer protection on one side of the market compared to a futures market position that is affected by both sides of the market. This one-sided protection is just what the S&L needs. If the S&L deals in options, then the side of the hedge that covers prepayments can be eliminated, and the S&L can protect itself only against the one-sided movement of rising interest rates.

Let us see how an actual investment in an option as a hedge would work. The price on 11 April 1985 of a 15 year, 8 percent, $100,000 contract on T-bonds was $70,812, which returns a yield of approximately 12.4 per cent. A put option giving the holder the right to sell $100,000 (par) of T-Bonds for $70,000 sells for $272. In our example, we will assume the S&L has a single $70,000 mortgage they wish to hedge. In order to hedge its portfolio of mortgages, an S&L could purchase one put option with a strike price of 70 that expired in September 1985 for a total cost of $272. If the portfolio is larger, the number of options purchased is increased proportionately. We assum that the value of the mortgage is perfectly correlated with the value of the T-Bonds. This insures that any change in the value of a mortgage will be identical to a similar change in value of the T-bonds.

As an example of how different interest rate changes affect the portfolio of this S&L, assume that the interest rates rose by two percentage points to 14.4 percent by September 1985; the date the option expired. The value of the T-Bonds (and the mortgage) would then drop to approximately $61,460, $\{1 - [1 \div (1.144)^{15}] \div .144\} + \$8,000 + [1 \div (1.144)^{15}] \times \$100,000$, creating a loss in the futures contract of $9,352 ($70,812 − $61,460). The option would rise in value to $8,540 (the difference between the current price and the striking price: $70,000 − $61,460). This would create a profit of $8,268 ($8540 − $272). The result is that the S&L would lose $9,352 in the value of its mortgage, but would gain $8,268 in the value of its option. The net result is a loss of only $1,084.

Let us see what happens if interest rates drop. If the drop is two percentage points then the value of the T-Bonds and the mortgage would be $82,155: $\{1 - [1 \div (1.104)^{15}] \div .104 \times \$8,000 + [1\} \div (1.104)^{15}] \times \$100,000$, or a rise of $11,343 (assuming no refinancing). The option would decline and expire worthless because the price of the underlying security ($82,155) is above the striking price ($70,000). The loss on the option would be the amount that was paid for the option, $272. The net result of the two positions would be a profit of $11,071 ($11,343 − $272).

These two scenarios plus three others are summarized in Table 1. The first column in Table 1 describes each scenario of interest rate changes by the time the option expires (September 1985). The second column identifies the change in the value of the T-bonds, or identically, the change in the value of the single $70,000 mortgage held by the S&L. The third column shows the profit or loss that would occur from holding the put option. Finally, the fourth column sums columns 2 and 3 to produce a net result to the S&L.

Table 1

	Gain/Loss		
Rates	Portfolio	Options	Net Result
+2%	−$ 9,352	+$8,268	−$ 1,084
+1%	−$ 5,000	+$3,916	−$ 1,084
0%	$ 0	−$ 272	−$ 272
−1%	+$ 5,279	−$ 272	+$ 5,007
−2%	+$11,343	−$ 272	+$11,071

Table 1 shows how the S&L is open to profit if interest rates drop, yet has a limited loss if interest rates rise. The gain/loss column for the portfolio shows that the portfolio can fall or rise by a virtually unlimited amount. Under the gain/loss column for the options, the S&L cannot lose more than the price of the option; however, the upside potential of the option is virtually unlimited. Combining the two effects shows that the options cannot increase the loss by more than the original purchase price of the option, yet can provide significant profit if interest rates move to affect the value of the portfolio adversely. However, as was stated earlier, if interest rates were to decline consumers would probably refinance their mortgages, causing the large profit in the gain/loss column for the portfolio to not be as high as the figures stated. But again, trading in options is significantly more advantageous as a hedge when rates fall than are futures contracts.

How many options should the S&L purchase in order to hedge its portfolio? If the S&L decides to hedge itself 100 per cent for a rise in interest rates of one percentage point, then it would need to purchase 1.28 options ($5,000÷$3,916=1.28). As can be calculated from Table 1 if the S&L owned 1.28 options, then the S&L would nearly break even between the portfolio and the options, that is, loss on the portfolio would still be $5,000, but the gain in the options would be $3,916×1.28=$5,012. If the rates rise two percentage points with this hedge, then the S&L would show a net profit of $1,231, that is, loss on the portfolio would be $9,352 and the gain in the options would be $8,268 × 1.28 = $10,583. If the rates went even higher than a two percentage point increase, the profit to the S&L would increase still further. However, if rates rise less than the S&L projected (or actually fell), the options would not provide a complete hedge. The S&L needs to decide how much protection it wants by determining its level of risk and evaluating the cost necessary to obtain protection at that level of risk. One goal of the S&L, then, is to try to decide the lowest level of interest rate rise requiring a minimum of a 100 percent hedge.

Fixed versus Variable Mortgages

What happens if the S&L decides to issue both fixed rate mortgages and variable rate mortgages? What should be the interest rate spread between the two mortgages? The fixed-rate mortgages could be "converted" to a variable-rate simply by purchasing an option on a futures contract and rolling it over until the fixed mortgage is paid off. On a typical 30-year mortgage with an average life of 12 years due to prepayments, the S&L would have to buy approximately 16 options back-to-back in order to hedge itself (12 years ÷ .75 year life of each option). Actually, the number of options purchased by the S&L would be less than 16 due to the amortizing nature of the mortgages. In other words, as the mortgage is slowly paid off, less and less protection is needed to protect that mortgage.

If the only difference between a fixed-rate mortgage and a variable-rate mortgage is the fact that a fixed-rate mortgage has an additional expense of purchasing options, then the spread in the interest rate between the two types of mortgages should be no more than the cost of the options. If every nine months the S&L has to spend an additional $600, for example, in order to convert an $80,000 fixed-rate mortgage, an extra cost of $600 for the required options could be covered by charging a rate which is 1.0 per cent higher than the rate on the variable (($600 x 1.333) ÷ $80,000 = .01). The $600 is spent every nine months, which translates into a yearly cost of $800. In order to raise an additional $800 on an $80,000, loan the rate must be increased by 1.0 per cent. This 1.0 percent, then, should be the spread between the fixed and variable rates.

It is actually not correct to say straight-out that variable rates should be 1.0 percent below fixed-rate loans, for example, because there is a great deal of difference between variable loans. There is already a pricing difference among variable loans due to features such as: 5 percent lifetime caps; 1 percent annual caps; 2 percent annual caps; or no cap at all. Default risk will also be greater with variable rate mortgages, because individuals with lower income can qualify for a loan at the lower interest rate on the variable-rate mortgage and may, consequently, suffer "payment shock" if rates should rise later. Each of these characteristics will add an additional element to the problem of pricing a variable-rate loan. But estimates can be made of the impact of the different characteristics and then a "standard" variable-rate loan can be established. This standard loan can then be compared to a fixed-rate in order to determine the spread between the two. Once the rate on the standard variable loan has been established, adjustments can be made to account for each individual characteristic.

Implications

Hedging with options has three impacts: (1) the method of hedging is actually more in line with the prepayment possibility of a mortgage portfolio than hedging in the futures market; (2) S&Ls can now determine more precisely what the cost difference is between a variable-rate and a fixed-rate loan, and (3) S&Ls can reduce some of the variability in the value of their loan portfolio.

If the spread observed in the marketplace is larger than the spread as determined by hedging with options, then the S&L can profit from the situation by offering the "overpriced" fixed rates and converting them to variables at a cheaper cost than is implied by the interest rate spread. The spread ought to narrow as S&Ls compete against each other in this way. The many different types of variable-rates offered may also be reduced as S&Ls realize which features are profitable and which are not.

A very simple simulation was conducted to see how option hedging might affect portfolio value. During the period from November 1982 through September 1985 options were purchased at each rollover date, each time purchasing the option with the longest maturity and with the strike price nearest the current value of the mortgage to be hedged. Under Rule One only one option was purchased, while two options were purchased under Rule Two. Under both rules the options were held until one day before expiration. The results for each rollover period are shown in Table 2:

Table 2

	Portfolio Profit/Loss	
No Option	Rule One	Rule Two
-$2,437	-$3,670	-$4,903
+$5,499	+$2,671	-$ 157
-$8,156	-$3,203	+$1,750
-$6,000	-$4,641	-$3,282
-$ 31	-$1,921	-$3,811
+$6,450	+$4,360	+$2,470
-$ 779[a]	-$1,067[a]	-$1,322[a]
$5,944[b]	$3,695[b]	$3,099[b]

[a] Mean
[b] Standard deviation

The results of the table show that an institution can reduce the variability of the value of its portfolio by purchasing options, but it does so at a cost. As the standard deviation was reduced as one moved from "no option," to "one option," and to the "two options" plan the mean change in the portfolio was also reduced. This indicates the strategy is a viable alternative to those institutions willing to pay a price to reduce the variability.

Individuals who obtain variable-rate loans might try to buy this same type of protection. If an individual has a variable-rate loan, he may protect himself by buying put options. If interest rates then rise, causing him to make larger monthly payments, his options will increase in value to offset the increased expense. However, the costs of information and expertise may keep most individuals from doing this themselves. An industry may arise providing interest rate insurance to the borrower. This industry would buy put options. However, the cross-hedging problems relating to the complexities of variable-rate mortgages (for example caps) suggest that the market might be better served by S&Ls shifting their interest rate risk through options on futures.

Options on futures provide an intriguing mechanism for both borrower and lender to protect themselves from interest rate swings. Although the lender could take advantage of economies of scale by purchasing large numbers of options, the borrower is nevertheless able to obtain some sort of protection for himself, and opportunities may expand in the future.

Illinois Econometric Model

Larry E. White

Beginning in this issue, the *Illinois Business Review* will publish forecasts of various data series from the Illinois Econometric Model. In each following issue, approximately four quarters of historical data and four quarters of forecasts will be presented for categories such as employment, personal income, average weekly hours worked, and average hourly earnings in Illinois. Four quarters of US historical data will be reported. A short synopsis of recent Illinois economic history and what the forecasts project for the near future will accompany the table. This article describes the development and maintenance of the Illinois Econometric Model to give the reader a better understanding of the data and the forecasts that are presented.

The current version of the Illinois Econometric Model maintained by the Bureau of Economic and Business Research at the University of Illinois (BEBR) was developed by David Diltz for his Ph.D. thesis in 1978. Since then, it has gone through several minor changes and revisions, but the basic structure that Diltz developed remains. The model is both an academic tool for the BEBR research assistants and an analytic device to provide leading information about the evolution of the Illinois economy. The research assistants employed by BEBR have the chance to apply the econometric theory and ideas acquired in the classroom. The modeling process teaches the student the intricacies and vagaries of the real world and that intuition is just as important as sound econometric technique. As a policy tool, the econometric model provides forecasts of employment, personal income, and other economic variables that can assist economic planners in their decisions.

The remainder of this articles explains in detail the process of developing the BEBR econometric model, specifically data collection, equation development, and forecast evaluation. All of these steps are interrelated and equally important; any deficiency in one area weakens the entire model. The development process is ongoing, with data revisions being accounted for and equations being restructured as needed.

Data Collection

Data collection and maintenance is certainly the most tedious of the modeling steps, but also the most important. If data is flawed with errors, then the forecasts from any equations are worthless. Since BEBR does not collect survey data, the model relies upon data collected and released by various government agencies. Most of this data is collected by surveying a sample of the population and then interpolating or estimating the value for the entire population. As more survey data becomes available to the agency, then the values that are publicly released are revised. Thus, there are three chances for errors in data collection to occur. The first concerns any errors in the survey method itself; the second, the failure to revise previously released data; a third, computer entry error. This can only be avoided by meticulous checking.

The current version of the Illinois Econometric Model uses 352 data time series, which are originally collected by four major sources. These series include employment, average weekly hours worked, average hourly earnings, and personal income for both the United States and Illinois, as well as several tax receipts series, housing starts, and retail sales for Illinois only. The Bureau of Economic Analysis in Washington, D.C. provides 50 series of personal income for both the United States and Illinois. This includes total personal income for several categories, as well as wage and salary personal income for the same categories. The Bureau of Labor statistics publishes employment, average weekly hours worked, and average hourly earnings each month for the United States in employment and earnings. Similar data for Illinois is released by the Bureau of Employment Security in Chicago. State agencies in Illinois publish tax receipts data every month, and the US Department of Commerce maintains a monthly series of retail sales. Personal income data is available only quarterly and, therefore, the model generates only quarterly forecasts. Other data are released monthly; and, while we maintain a monthly data base, these series are transformed into quarterly data to conform to the model. Each series is then seasonally adjusted using the X11-ARIMA techinique of Statistics Canada.

The release of historical data suffers from a serious lag problem. While tax data for Illinois is released with a lag of less than a month, other data series are not. Employment data is released two months after the reporting date, and personal income is released four months after the end of the reporting quarter. Because BEBR forecasts each month, the lag in data release often causes the forecast to include a quarter that is, in fact, already history. This problem can be corrected only by discontinuing the use of any data released with too long a lag, or driving the forecasts with data that is released immediately.

Once our historical time series are updated to current data, concensus forecasts for the US economy are collected to drive our forecasts. Data Resources, Inc. of Lexington, Massachusetts, and Chase Econometrics of Bala Cynwyd, Pennsylvania are two of the sources that are relied on for these forecasts.

Equation Development

As the initial data was being collected, the basic forecasting equation structure was being developed. This basic structure provided guidelines for data collection; and after the collection was complete, the specific equation structure was chosen and tested. Certain modeling decisions must be made prior to the equation development, such as the level of industry aggregation to forecast; what is known prior to data collection and equation regression; and the degree of simultaneity of the model relationships. Other decisions were made during the equation development process, such as the exact independent variables in each relationship and any lag that exists between independent and dependent variables.

The Illinois Econometric Model contains five basic variable groups: employment, average weekly hours, average hourly earnings, personal income, and tax receipts. The first four variable groups are forecasted at the major-industry-classification level. These industries are mining; construction; manufacturing; wholesale and retail trade; transportation and public utilities; finance, insurance, and real estate; and services. The manufacturing industry is also forecast at the two-digit level.

Each variable group was postulated to follow a basic equation form. Employment is a function of industrial production, the relative Illinois-US wage rate, and a time trend. The relative wage is a function of the lagged dependent variable; the ratio of US industry employment to Illinois industry employment; and a time trend. The Illinois average weekly hours in each industry is a function of the US hours and time trend. Wage and salary personal income is a function of employment, hours, and wages; total personal income is then a function of wage and salary personal income. Finally, taxes are each a function of real personal income.

The equation for a particular variable in a given industry may be quite different from the equation for the same variable in a different industry. Certain postulated variables may be found statistically insignificant and dropped for the equation. Some variables are lagged, one, two, or four quarters, depending upon the particular industry. In other equations, substitutions have been made in the basic postulated structure. In some small industries, such as miscellaneous durable goods manufacturing, total manufacturing employment has been substituted for industrial production as an independent variable.

Forecast Evalution

The goal of the Illinois Econometric Model is to produce accurate forecasts of the Illinois economy. Consequently, after the model has been developed, forecast evaluation is allocated a considerable amount of time. Forecasts are checked for irregularities and reasonability. Each month regression results are reevaluated in terms of the statistical significance of the independent variables, equation fit, and theoretical reliability. Ultimately, the forecasts will be compared to survey data when it is eventually released.

During the forecast evaluation period, errors are corrected and relationships may be altered. An initial superficial check of the forecasts is made for irregularities. Since the forecasts are for seasonally adjusted time series over a short period of time, extreme changes from period to period are unexpected. Many of these cases are a result of a data error that has gone undetected and is easily remedied. If not, institutional events within an industry are examined. If this does not explain the unexpected change, more drastic modeling steps are taken. The particular regression equation is examined more closely and is either altered or reformulated altogether.

The evaluation is simplified by monitoring the timing and impact of institutional changes in the Illinois economy. This involves legislative changes, new industry development, major labor strikes, and the general evolution of the US and Illinois economies. If this is done carefully, few extreme forecast differences from quarter to quarter are expected.

Finally, all forecasting irregularities are not necessarily the fault of the model itself. Concensus forecasts for the United States are collected from various sources, and any flaws will be reflected in the Illinois forecasts. This problem is beyond control.

Conclusion

The development of the Illinois Econometric Model was a large undertaking. A great deal of preparation was involved so that the complexity of the collection and modeling process did not cloud the issues that were to be examined. Once development was complete, the same care had to be used to maintain the model. In avoiding as many mistakes in data handling and forecast judgment as possible, the model has been maintained in a workable form that both provides forecasts and allows improvements.

The model will never be complete and merely mechanical. The dynamic nature of the US and Illinois economies render this impossible. With the goal of the Illinois Econometric Model being accurate forecasts, the modeler must remain in touch with the changing economy and not become a mere mechanic of computer programs.

Illinois employment levels in each industry continue to reflect US employment levels. The decline in employment in manufacturing is being offset by increases in service-providing industries. During the next year, Illinois manufacturing industries will lose about 12,000 jobs, almost half of which will be in the fabricated metals industry. This decline will be more than offset by the service sector, which will gain 28,000 jobs, and the finance sector, which will gain 15,000 jobs. This transition of employment from goods-producing industries to service-providing industries shows that Illinois continues to move out of the recession of the early 1980s. As this institutional change becomes complete, Illinois' economic growth will proceed, but within an altered framework.

ILLINOIS ECONOMIC FORECASTS: 1984:IV–1986:III
Employment (in Thousands)

	1984:IV	1985:I	1985:II	1985:III	1985:IV	1986:I	1986:II	1986:III
Mining								
US	977.00	976.00	979.00	964.00				
Illinois	24.22	24.10	25.42	25.74	25.48	25.06	24.64	24.25
Construction								
US	4432.00	4537.00	4646.00	4690.00				
Illinois	141.48	150.29	163.79	167.36	166.25	165.25	163.81	162.30
Manufacturing								
US	19560.00	19560.00	19430.00	19330.00				
Illinois	983.29	972.72	953.38	945.03	941.29	940.81	938.44	932.96
Durable Goods Manufacturing								
US	11670.00	11680.00	11580.00	11500.00				
Illinois	616.28	604.67	587.19	578.91	577.66	578.29	576.60	571.90
Primary Metals								
US	848.00	839.00	819.00	801.00				
Illinois	60.54	59.15	56.82	55.20	54.66	53.92	53.84	52.46
Fabricated Metals								
US	1486.00	1483.00	1476.00	1465.00				
Illinois	111.43	111.57	110.74	110.87	109.27	109.35	108.23	105.43
Nonelectrical Machinery								
US	2232.00	2224.00	2200.00	2163.00				
Illinois	158.87	153.93	147.81	143.19	144.63	145.92	147.06	147.87
Electrical Equipment								
US	2250.00	2248.00	2215.00	2186.00				
Illinois	133.32	132.05	128.54	126.64	124.63	123.53	121.77	120.39
Miscellaneous Durable Goods								
US	4857.00	4884.00	4875.00	4882.00				
Illinois	151.82	146.71	144.09	143.84	144.47	145.58	145.71	145.74
Nondurable Goods Manufacturing								
US	7891.00	7888.00	7846.00	7835.00				
Illinois	368.48	367.23	365.89	365.87	363.63	362.52	361.85	361.07
Food Products								
US	1622.00	1635.00	1636.00	1632.00				
Illinois	96.23	95.61	95.06	95.10	94.79	94.65	94.50	94.26
Printing and Publishing								
US	1395.00	1405.00	1415.00	1426.00				
Illinois	102.33	101.87	102.71	103.26	102.65	102.53	102.31	102.02
Chemicals								
US	1052.00	1052.00	1045.00	1038.00				
Illinois	61.15	61.43	60.45	60.81	60.32	59.97	60.12	60.36
Miscellaneous Nondurable Goods								
US	3756.00	3729.00	3684.00	3676.00				
Illinois	108.19	108.12	107.26	106.53	105.87	105.37	104.92	104.42
Utilities and Transportation								
US	5233.00	5267.00	5291.00	5303.00				
Illinois	271.05	274.17	274.40	276.95	274.28	271.93	269.95	268.23
Finance, Insurance, and Real Estate								
US	5756.00	5811.00	5884.00	5959.00				
Illinois	321.24	321.54	322.45	324.38	328.59	332.33	335.79	339.05
Wholesale and Retail Trade								
US	22610.00	22870.00	23120.00	23290.00				
Illinois	1124.46	1158.52	1162.30	1166.80	1165.31	1165.76	1166.64	1167.41
Services								
US	21170.00	21500.00	21800.00	22050.00				
Illinois	1032.33	1058.51	1071.05	1084.64	1090.85	1097.70	1104.84	1112.14

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ILLINOIS BUSINESS INDEXES

	Percent Change Sept 1984-Sept 1985	Sept 1985	Aug 1985	July 1985	June 1985	Sept 1984	Aug 1984
Coincident Indicator (1969=100)	13.77%	126.68	125.21	122.39	122.80	111.35	111.42
Employment-manufacturing (in thousands)[e]	-4.42%	950.7	952.4	951.8	959.4	994.7	992.3
Average weekly hours-manufacturing[e]	-1.21%	40.8	40.4	40.2	40.7	41.3	40.8
Weekly earnings-manufacturing[e]	1.51%	$426.36	$420.56	$417.68	$423.28	$420.02	$411.26
Help wanted advertising-Chicago (1969=100)[a]	-1.04%	95	98	101	99	96	102
Help wanted advertising-St. Louis (1969=100)[a]	11.67%	67	65	67	73	60	56
Retail Sales (in millions)[b]	5.68%	$4,858	$5,573	$5,350	$5,347	$4,597	$5,100
Coal production (in thousands)	-2.77%	5,193	5,384	4,270	4,750	5,341	6,605
Petroleum products (in thousands)[e]	4.57%	2,562	2,647	2,525	2,445	2,450	2,534
Vendor performance	-27.59%	42.0 %	42.0%	44.0%	44.0%	58.0%	54.0%
Building permits (in thousands)							
Residential housing units	54.86%	3.554	4.055	4.440	4.012	2.295	2.763
Value of Residential housing	52.00%	207,827	$219,135	$247,850	$223,064	$136,727	$165,638
Value of nonresidential construction							
Industrial buildings	28.12%	$26,517	$30,617	$34,493	$28,321	$20,697	$30,370
Office, banks, and professional buildings	-19.02%	$31,665	$64,984	$119,121	$22,439	$39,102	$245,290
Stores and other mercantile buildings	116.84%	$34,035	$25,516	$31,400	$17,680	$15,696	$30,171
Other	0.89%	$3,507	$5,540	$5,075	$6,273	$3,476	$3,055
Consumer price index (December 1977=100)							
North Central US[c]	2.71%	–	174.3	–	174.2	–	169.7
North Central/population more than 1,250,000[c]	3.48%	–	178.3	–	177.6	–	172.3
North Central/population 385,000 to 1,250,000[c]	2.02%	–	171.5	–	172.6	–	168.1
North Central/population 75,000 to 385,000[c]	1.50%	–	169.1	–	169.6	–	166.6
North Central/population less than 75,000[c]	2.46%	–	170.7	–	170.4	–	166.6
Chicago (1967=100)	3.55%	326.3	325.9	324.4	324.1	315.1	313.4
St. Louis (1967=100)	3.28%	321.6	–	319.9	–	311.4	–
		1985:II	1985:I	1984:IV	1984:III	1984:II	1984:I
Personal income (in millions)[d,e]	6.51%	$166,908	$164,894	$162,200	$160,180	$156,710	$153,752
Per capita personal income[d,e]	5.28%	$14,311	$14,148	$14,024	$13,871	$13,593	$13,386

[a] The Conference Board, *Help Wanted Advertising*, September 1985. [b] Latest month projected by BEBR. [c] Percent change between August 1984 and August 1985. [d] Percent change between 1984:II and 1985:II. [e] Recent month is preliminary figure.

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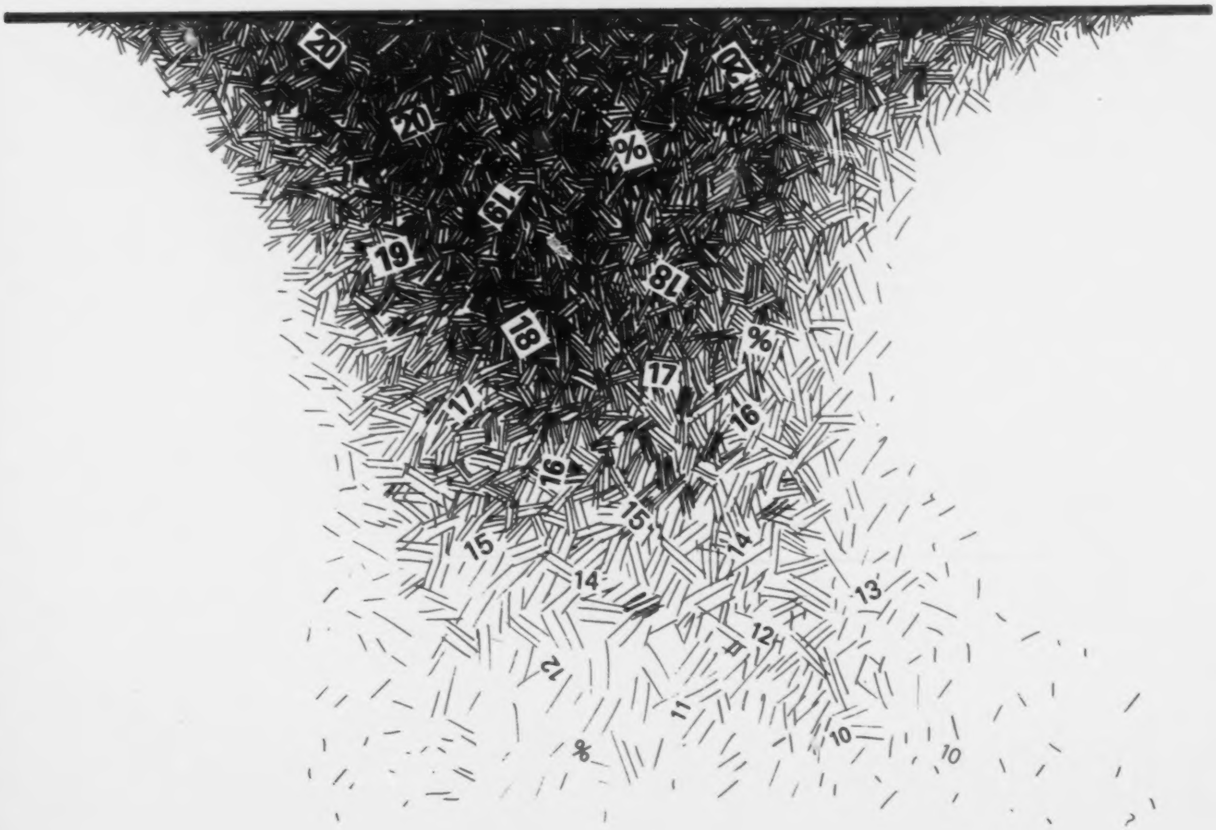
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WILLIAM R. BRYAN

The Outlook for Interest Rates

Interest rates are likely to continue to decline for the near-term future, although the decline will not be without interruption. More important, over the longer run there is a good chance of a break in the general upward movement in rates that has characterized the past three decades.

The interest rate forecast is spelled out fully in the next section of this article. Following that, there is a general discussion of the errors inherent in forecasts of this sort, even in the unlikely event that they turn out to be reasonably accurate.

Future Changes in Interest Rates

Interest rates have declined sharply since mid-1984 and have fallen more than 8 full percentage points from the levels reached in late 1981. On average, interest rates have declined 37 basis points per month during the most recent period of decline. There are at least two important questions relating to future interest rate developments. One is concerned with interest rate changes in the near-term future, but the more important question deals with interest rate trends over the long run.

What about the near-term future? As a short-hand way of talking about interest rate developments, it is useful to regard the level of nominal interest rates as the sum of a so-called "real" rate and an inflation premium. By adjusting for expectations regarding future rates of inflation, the inflation premium serves to keep rates of return on debt appropriately related to returns on real assets.

Expectations are not observable, but they may reflect an accumulation of evidence relating to inflation experience. In addition, there are those who may be gifted at interpreting recent or current economic policies, or in forming insights regarding future policies. Moreover, there may be analysts who understand the effects of policy variables on the future course of events. To the extent that there can be informed predictions, these too can be brought to bear on inflationary expectations. But such insights are beyond the scope of this article.

An extrapolation of inflationary experience over the past several years suggests that the inflation premium is about 4 percent. Research evidence relating to the real rate indicates that it varies between 2 and 4 percent. In simple-minded fashion, a matrix of possibilities has been specified within which to talk about prospective developments during the next six months or so (see the Table). However, each of the outcomes in the matrix are not equally plausible. Thus, for example, it is implausible to believe that the real rate will move to 4 percent in the next year or so. Similarly, it is implausible to suppose that the inflation premium will fall to 2 percent. Thus, within the framework of this mechanistic view, interest rates (as measured by yields on one-year US Treasury securities) in the next 6 to 12 months will be bounded between 6 and 9 percent. At this writing, yields on one-year Treasury securities were fluctuating near the 7.5 percent level—fluctuating upward.

Table. Future Nominal Interest Rates

	Range of Movement in the Real Rate:		
	2%	3%	4%
Range of Movement in Inflation Premium	*Nominal Interest Rates*		
2%	4	5	6
4%	6	7	8
6%	8	9	10

The view presented here is that interest rates will move generally downward by as much as 50 basis points. Such a movement would take yields on US Treasury securities to 7 percent. Even if this view is reasonably correct, it is important to superimpose a set of random fluctuations similar to those appearing around the fitted lines on the Chart (discussed later). Hence, interest rates can show rather large, temporary movements. The purpose of this reminder is to give courage to the faint-hearted, to those who might be misled by very short-term, self-reversing fluctuations.

But what about the long run? Interest rates have moved upward in stair-step fashion over the past 25 years. In each successive five-year period, interest rates were higher than in the preceding five-year period. Has that movement ended? It borders on foolishness to suppose that meaningful conclusions about the long run can be made on the basis of experience of a few years. But it is necessary to cross that border at this time. The view presented here is that the long-run upward movement in interest rates has been blunted.

The cornerstone to such a view rests on the important association between the decline in interest rates and the decline in rates of inflation. The decline in interest rates did not result from an expansive monetary policy. Instead, interest rate reductions are simple reflections of a decline in the inflation premium.

Why did rates of inflation decline? The most common explanation has several components. One aspect of the explanation rests on the observation that the economy has been weak for an extended period of time. The economy limped through 1979, sagged badly during 1980, rebounded weakly into mid-1981, then moved into a prolonged recession from the late summer of 1981 through late 1982. As a consequence of approximately four years of weakness, excess demand was wrung from the economy and institutional biases toward rapid price increases were altered. Labor concessions in wage bargains, unheard of for 40 years, became a factor in labor negotiations. Against that background, the subsequent economic expansion, now nearly three years in duration, has not moved into a period of accelerated price increases.

Another aspect of the usual explanation for the moderation in price increases relates to the intense competition of foreign goods. With high-quality foreign goods flowing into the United States, domestic producers have been limited in their ability to raise prices. In addition, and partly as a consequence, the economic expansion has been accompanied by increases in productivity.

But does that mean that inflation will be renewed as soon as these special factors lose their force? Perhaps. But it is my view that since price stability is not unusual, it requires very little explanation. Instead, the part of our economic past that is unusual is the accelerated inflation of the second half of the 1960s and the 1970s. Barring a return of the factors leading to accelerated inflation—war, major disturbances in raw materials sources, along with a large jump in characteristic monetary growth rates—there is a reasonable presumption that the economy will be substantially free of rapid inflationary run-ups.

What this means is that the long-term upward movement in interest rates is halted. It is possible to achieve further interest rate declines over the long-run. Future interest rate declines depend upon further reductions in the core rate of inflation.

Limitations of Interest Rate Forecasts

Forecasts of future movements in, or the levels of, interest rates, such as that presented above, are quite common. But the task is uncommonly difficult, in the sense that useful forecasts are infrequent. There is, as well, likely to be considerable error, even in forecasts that, after the fact, may be regarded as generally accurate. Moreover, what is unknown can be critically important.

In what follows, I give some idea of the magnitude of error consistent with reasonable understanding. This discussion is carried on within the context of time-series analysis.

Time-Series Analysis

One approach to the analysis of an economic time series is to decompose it into its constituent elements. It is common to imagine that an economic time series—such as industrial output, retail sales, employment, and so forth—is affected by secular, cyclical, seasonal, irregular, and random factors. Secular forces relate to those factors that have exerted a persistent influence over an extended period of time, perhaps as long as 20 or 30 years or longer. Cyclical forces are those associated with what is frequently referred to as the business cycle. Such forces may last several years, depending upon the duration of the cycle. Seasonal forces are those that register a yearly, or shorter, periodicity. Irregular forces refer to explainable episodes without definable periodicity—such as strikes, natural disaster, political decisions, and so on. Random factors relate to unexplainable variation, presumably both positive and negative shocks.

There is a widely held view that interest rates show no seasonal periodicity. That view is not challenged here. Nor do I make any effort to differentiate between irregular and random changes. In what follows, I limit attention to secular and cyclical factors.

Secular Changes in Interest Rates

Using monthly yields on one-year US Treasury securities of constant maturity, a trend line was fitted through interest rates for January 1959 to June 1985. Results show that, on average, interest rates rose about 3 basis points (three-hundredths of one percent) per month during the period. There is a view that the upward trend resulted from successive revisions in expectations regarding inflation.

It could have been very useful for a small number of people to have possessed that information at the beginning of, or early on during the 26-year period. If such knowledge had been in the hands of would-be borrowers, it would have increased their demands for borrowed funds. In contrast, if such knowledge had been in the hands of long-term lenders, they could have gone out of business. Of course, if everyone had "known," actual experience would have taken a different path.

The typical, or standard, deviation in monthly interest rates on one-year Treasury securities during the period was 324 basis points. Even after fitting the trend line through the data, substantial variation remained. The variation around the trend line averaged 181 basis points, and the range of error (from high to low) was 1,027 basis points. Measured in terms of forecasted values, the error averaged more than 26 percent.

In short, even if an individual business or household had held an accurate view of long-term trends, it would have found itself ill-prepared for many short- to intermediate-term decisions.

Cyclical Changes in Interest Rates

There were 11 contrasting periods of cyclical change during the 318 months from 1959 to 1985. As it turns out, there were more periods of rising interest rates than periods when interest rates were falling. Moreover, the periods of rising rates were much longer than the periods of declining rates. Interest rates generally drifted upward for about three-fourths of the time.

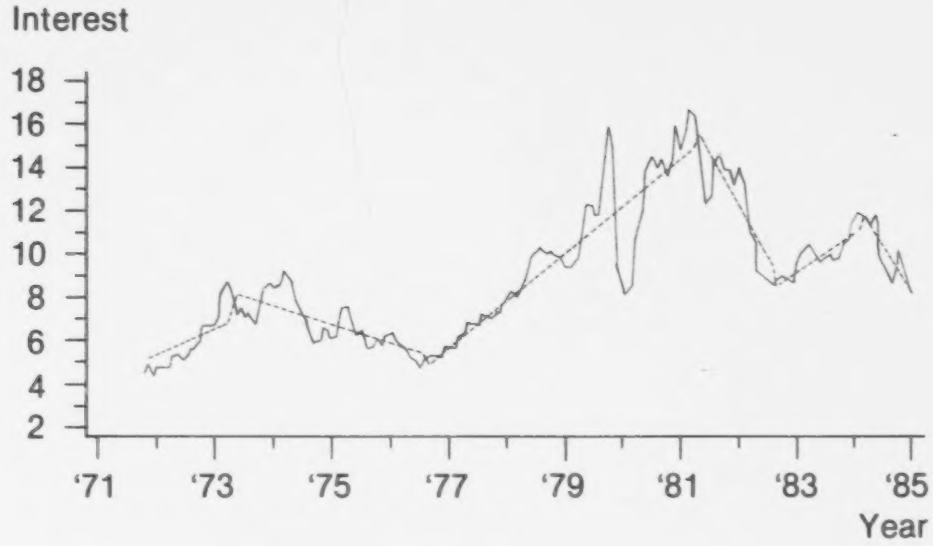
Suppose we had been able to differentiate between these cyclical episodes. The Chart presents the interest rate data with lines filled through periods of rising and falling interest rates. (The time periods were identified by visual inspection, and the trends were fitted by least-squares techniques.) During periods when interest rates were rising, the average monthly increases ranged from 18 basis points to less than 1 basis point. By comparison, during periods when interest rates were falling, the average monthly declines ranged from more than 40 basis points to just over 7 basis points.

If the cyclical episodes represented by the fitted lines constituted the state of knowledge, there would have been a substantial reduction in unexplained interest rate movement. The deviation around these cyclical trend lines averaged 79 basis points.

Concluding Remarks

The short-term interest rate forecast presented in the first section is essentially a prediction that dominant forces will not change. Instead, there will be a continuation in the downward movement in interest rates that began in late 1981. But the movement will not continue for much longer. The longer-run interest rate forecast is a prediction of change. It rests on the view that there have been important shifts in the economy.

The second major section of the article warns that even if the principal forecasts are correct, there is substantial remaining fluctuation. I have made no attempt to predict very short-term, reversible fluctuations. ●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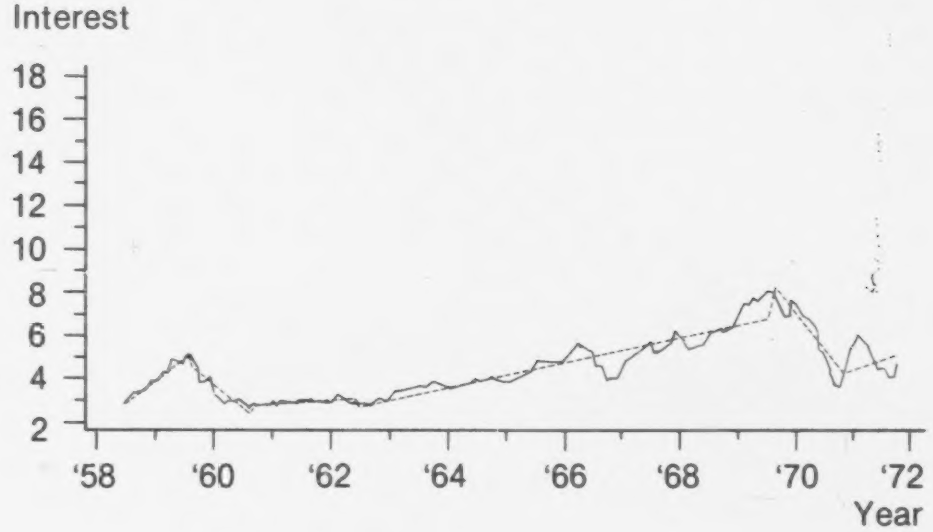
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LEONARD F. HEUMANN

Illinois Housing: An Analysis of Changing Conditions and Needs

A housing needs analysis is a means of identifying the number and percentage of housing units that are substandard or overcrowded, those households that cannot afford decent, safe, and affordable housing on the private market, and the changes in household demographics and housing conditions over time that can aid in the development of future housing policy and program design. This article reports on such a housing needs analysis for Illinois, conducted in 1984 for the Illinois Housing Development Authority. The full report analyzed over 14 different data sources, for 144 separate areas of the state and employed over 500 variables. The analysis relied on secondary data with primary emphasis on the US Census. While the results provide one of the most comprehensive pictures of housing needs in Illinois history, there are still severe limitations to the use of secondary data. All the measures of housing need used have limitations. Nevertheless, some clear trends and planning implications emerge. This article will deal primarily with state-wide data and not the 143 areas of the state analyzed in the larger study.

The findings will be divided into three major sections: important housing-related economic and demographic trends; inadequate housing; and housing needs resulting from excessive housing costs.

Demographic and Economic Characteristics

Population Characteristics

Net outmigration was the single most important population trend in Illinois between 1970 and 1980; its character has important long-range implications for housing needs and program priorities. Population increased 2.8 percent to 11.41 million residents during the decade, less than one-fourth the national growth rate and one-third the state rate over the previous 40 years. This is due to the outmigration of 380,687 persons, a rate of 3.4 percent.

Economic Conditions

As a predominantly industrial state, Illinois was hard hit by the recession of 1980–1982. The average unemployment in 1979 was 5.5 percent, rising to 11.4 percent in 1983. During the subsequent recovery, overall unemployment dropped to less than 10 percent by April 1984, but that was exceeded substantially in many rural areas and older, industrial cities. The state's labor force grew by 18 percent in the 1970s, as a result of "baby boom" children entering the workforce for the first time and to the increased participation of women. Were it not for the outmigration of active workers, the unemployment figures would probably be much higher.

Household Characteristics

The most dramatic shifts occurred in household statistics. While husband-wife households constitute 60 percent of the total, their number decreased by 2 percent in the 1970s compared with a national increase of 10 percent—suggesting an especially high proportion of young adults delaying marriage or an outmigration of families. One-person households increased by 49.5 percent and two- and three-person households increased by 1.2 percent, while four- and five-person households declined 6.6 percent and larger households declined 32.5 percent. The average number of persons per household declined from 3.09 in 1970 to 2.76 persons by 1980. If the trend in smaller households continues, one strategy may be to build smaller, more efficient houses for small households.

Elderly Households

These grew substantially during the 1970s. Illinois was one of only seven states with more than one million persons over 65 (1,259,296) in 1980. Statewide, 20.5 percent of all units were occupied by a householder aged 65 or older, while in many counties the figure ranged as high as 25 to 33 percent. Their numbers will continue to increase, especially the "old old," aged 75 and older, a group that will double in this quarter century. New solutions will be required to cope with the needs of this group because of its health problems, the survival gap between spouses and a decreasing pool of children to support elderly parents. One strategy calls for congregate-care facilities—private apartments with congregate dining, housekeeping, and social services—to bridge the gap between traditional housing for the independent elderly and nursing homes.

Female-headed Families

A dramatic 34.7 percent increase in the number of female-headed families occurred in the 1970s, bringing the number of such households with children under 18 and no husband present to 429,143 or 14.6 percent of the state's households. Most resided in Chicago (44.8 percent) and the larger urban centers. Of those families, 30.8 percent were below the poverty line and comprised 48.7 percent of all families in poverty. They require safe, affordable housing but are frequently victims of discrimination and are unable to devote adequate time to their housing search; they require day care, social services, and the assistance of governmental transfer payments.

Rural Net Immigration

Despite the state's net outmigration, there was net immigration in five suburban SMSA counties, due essentially to the growing employment base in newer municipalities surrounding Chicago and to the housing demand of young families that are economically upwardly mobile, many buying their first home. There was also significant growth in non-SMSA rural counties in the 1970s. This was a new phenomenon that was reported nationwide. It occurred mainly in the southern counties of Illinois and occurred without any economic growth serving as a catalyst, since unemployment remained high in these counties. This may be retirement-age households returning to rural areas they left years ago and urban retirees seeking environmental amenities in affordable retirement locations. According to recent national statistics, this phenomenon has ended. However, there still may be pockets of fast-growing rural townships in Illinois with very attractive environments, close to interstate highways, that provide more land and housing amenities per dollar than urban areas, especially for lower income retirees.

The Dwindling Housing Supply

One way to measure the state of the housing stock is the percent of vacant standard units. A vacancy rate of 2–3 percent for owner-occupied housing and 5–8 percent for rental housing provides adequate choice and mobility while retaining an adequate sales price and rent structure. In 1980 the vacancy rates were 1.8 and 7.5 percent, respectively, in Illinois. However, the market tightened dramatically in the next three years. In Chicago, for example, the owner vacancy rate was 1.8 percent in 1980 and 0.6 percent in 1983; rental vacancy rates were 6.7 percent in 1980, dropping to 1.1 percent in 1983.

Chicago also reflects the changes in housing tenure throughout the state resulting in decline of rental units. Rental units in Chicago declined absolutely in the 1970s by 73,300 units or 6.4 percent. Condominium conversions during the decade increased by 57,400 units or 280 percent. By 1980 condominiums accounted for 5.3 percent of the occupied housing stock in Chicago.

There were only 176,679 subsidized housing units or 4.4 percent of the total stock in the state at the end of 1983, while 11.3 percent of the state's households had incomes below the poverty level. Despite the fact that Chicago had 44.2 percent of all the subsidized units, only 6.6 percent of all the city's housing was subsidized at the end of 1983, and most of that was built prior to 1981 with few additions since.

Rising Poverty Levels

In 1980, 40.6 percent of the state's population had low to moderate incomes (below 80 percent of the median)—a relative increase of 9.9 percent over 1970. Of those, 25.5 percent had low incomes (below 50 percent of the median)—a relative increase of 27.9 percent. Far more renter households (21 percent) were at or below the poverty line in 1980 compared to homeowners (5.8 percent).

Persons under age 65 were hurt most during the '70s. By 1980, 20.7 percent of the nonelderly were in poverty, an increase of 53.5 percent over 1970. Although the elderly made some income gains due to increased eligibility and participation in pensions, social security, and housing subsidies, 15 percent of this rapidly growing population were still in poverty.

Inadequate Housing

There are two broad classes of housing need, one resulting from inadequate housing requiring rehabilitation or removal of the unit and relocation of residents to adequate housing, the second overly costly housing. Inadequate housing from a health and safety standpoint can result from overcrowded living conditions, substandard shelter, or substandard surrounding environment.

Overcrowding

This traditional housing need indicator is rapidly becoming a nonissue, especially in smaller cities and non-SMSA counties. This is due to outmigration and decreasing household size, as more younger persons and the elderly live alone and younger families have fewer children. In 1980 there were 158,366 households in which occupancy exceeded 1.01 persons per room, a decline of 107,088 for the decade. Among rental units, crowding declined 32.9 percent in the 1970s, from 9.2 percent to 6.2 percent. Among owner-occupied units the decline was 60.4 percent, from 6.5 percent to 2.6 percent. Almost 53 percent of all overcrowded households were in the city of Chicago, and 90 percent in the 29 largest municipalities. Even in Chicago, crowding occurred in only 9.2 percent of the rental units and 5.3 percent of the owned units.

Substandard Housing

Since 1970, the US Census has relied on the residents of each housing unit to report on their housing conditions as opposed to the use of trained enumerators. Residents cannot evaluate the condition of a structure and its contents so the census has had to rely on surrogate measures that the lay public can report accurately. These are lack of some or all plumbing for exclusive use of the household, lack of adequate heating, lack of complete kitchens, and a combination of the age and value of the structure (useful only for single family housing). The first of these measures, lacking plumbing, has been the most reliable over time. However, even this measure is very unsatisfactory and variable, depending on local housing age and conditions, codes, and code enforcement. Today a housing unit can have complete private plumbing but the condition of that plumbing, not to mention the remaining structure and content of the building, can be wholly inadequate. As a result, the census figures very likely underestimate actual conditions.

Statewide, between 1970 and 1980, renter households in units lacking plumbing showed a relative decline of 45.6 percent, from 5.4 to 2.9 percent; among owner-occupants the relative decline was 65.2 percent, from 2.5 to 0.9 percent. Fewer units (1.4 percent) lacked complete kitchens than lacked plumbing for exclusive use (1.6 percent), and only a fraction more (2 percent) lacked adequate heating.

Substandard Environments

There is no adequate measure of the amount of housing, standard or substandard, located in areas inadequately serviced by public utilities. Similarly, we know little about areas with dangerously high ground or air pollution, high crime rates, or any other measure of a substandard environment.

Excessive Housing Costs

The federal Department of Housing and Urban Development recently adjusted the threshold of excessive housing cost up from 25 to 30 percent of gross yearly household income. Persons paying more than 30 percent are defined as in need of a housing subsidy. Many economists dislike the use of any measure of excessive housing cost to determine housing policy and program priorities. They argue that measures of substandard units directly indicate a need for a housing solution, either rehabilitation or replacement, but excessive housing cost figures do not necessarily indicate housing solutions because these figures include households occupying standard units. Excessive housing costs, they argue should be included with general income transfer policies and programs. I do not think most housing analysts would argue with this logic, and so long as society is politically willing and economically able to ameliorate poverty with general transfer payments or other means and also ameliorates excessive housing costs, there is no problem. The need for an adequate measure of excessive housing costs arises from the lack of adequate transfer payments to ameliorate the housing problems. If we are going to set targets or priorities on households for subsidies (be they income or rent subsidies), it may make sense to identify the poorest households who are also paying excessive housing costs. So long as society must, or chooses to, limit and/or target its transfer payments, for whatever reason, the question is not whether we analyze excessive housing costs, but what is a useful and accurate measure.

Thirty percent of gross income for housing without accounting for total income or household size is a poor indicator of excessive housing costs, because it lumps together small households with large incomes paying 30 percent or more of income for housing by choice with large households with small incomes paying 30 percent or more of income for housing out of necessity.

Ideally, we would like to cross-tabulate income by household size by percent of income going to housing. In this way the highest priority need group could be identified. This is not possible with available census tables. Instead, two measures were used in this study: households paying 30 percent and 40 percent or more of gross yearly income for housing and earning less than $20,000 in 1979.

The combination of dwindling housing supply and increasing poverty, documented in previous sections, has resulted in a large and growing proportion of Illinois households with excessive housing costs. At the 30 percent threshold, 9.5 percent of owner occupants (240,324) and more than one-third of the renters (500,966) had excessive housing costs. At the 40 percent threshold, 5.6 percent of Illinois home owners and 22.8 percent of renters had excessive housing costs in 1980. It was only possible to compare renter occupants paying 35 percent of income for housing between 1970 and 1980. The data showed 31.1 percent of all renters paid 35 percent or more of their income for housing in 1980, an increase of 24.5 percent of all renters in this predicament over the decade.

Conclusions

Illinois is experiencing numerous changes in its population, household structure, and housing stock that will vary housing use, demand, and need for low income support over the coming decades. What this article does not cover is the tremendous variations in housing statistics and housing need uncovered when comparing the municipalities over 50,000 population or the SMSA counties or regions of the state (see the full report)[1]. It is at these levels of analysis that many more planning priorities for the state become apparent. What is obvious at all levels of analysis is how poor the census variables are both for measuring the extent of housing need and cross-tabulating housing need indicators by key household characteristics necessary for policy analysis and program planning. State and local planners need for better assessments of the housing stock, its condition, and the condition of the surrounding environment than is possible with existing secondary data. Even what housing data has been collected is not reported in fixed table formats that are useful for housing planning, be it by private or public developers. Key cross-tabulation of housing condition by both household income and size are critical for planning but nonexistent for most planning jurisdictions. ●

[1] L. F. Neumann, *Illinois Housing: An Analysis of Changing Conditions and Needs,* Housing Research and Development Program, University of Illinois, November, 1984, 321 pages.

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LARRY WHITE

Is Unemployment a Labor Supply Problem?

Employment and unemployment have always been concerns for economists; but ever since the unemployment rate reached double digits in 1982, the employment and unemployment levels have become topics of conversation for everyone, regardless of occupation. Most of these conversations center on why business and government have not been able to stimulate the economy enough to provide jobs for everyone. Many reasons for high unemployment are cited—ranging from high oil prices and the recession of the early 1980s to the inability of the president and Congress to deal with the problem.

Most discussions of high unemployment focus on explanations relating to the demand side of the labor market. That is, one usually asks why there are not more jobs. But by definition, there is unemployment if the actual labor supplied exceeds the labor demanded. Hence, the problem has both supply and demand elements.

Any economics textbook will explain that the quantity of labor demanded is inversely related to the wage level while the quantity of labor supplied depends positively upon the same wage level. These books will also go on to explain that eventually an equilibrium wage will be found, where the quantity of labor supplied and demanded will be equal, and anyone who desires a higher wage will not be in the labor market. While this explanation falls short of providing a description of real labor markets, it illustrates that unemployment is not merely a matter of not enough jobs to go around, but a supply phenomenon as well.

The supply of labor is the number of people that constitute the labor force, and the labor force participation rate is the percentage of the population in the labor force. In comparing the changes in the size of the labor force and the labor force participation over time, one can trace labor supply patterns and integrate its importance into a discussion of the unemployment rate.

The purpose of this article is to highlight the importance that the quantity of labor supplied has had on the unemployment problem. To accomplish this purpose, two areas were studied. The first is a historical view of the population, the labor force, the level of employment, and the level of unemployment since 1950. Large changes and trends will be highlighted for each category as well as for the male and female components. Second, the results of three labor force growth simulations are reported. The 1950 labor force will be taken as given; the male and female labor forces will then be forced to evolve in ways that are different from actual events since 1950; on these new bases the unemployment rates will be calculated and presented. Even though the methodology is quite simple, the study clearly shows that unemployment levels are supply oriented as well as demand oriented.

Historical Perspective

The size and growth of the population and labor force are important to the problem of unemployment. To maintain its relevence to employment, the population studied is restricted to noninstitutionalized persons of at least 16 years of age. The labor force is the sum of those employed and those unemployed, with the unemployed defined as those without jobs who are actively seeking one. The residual of population and labor force is simply termed "not in the labor force."

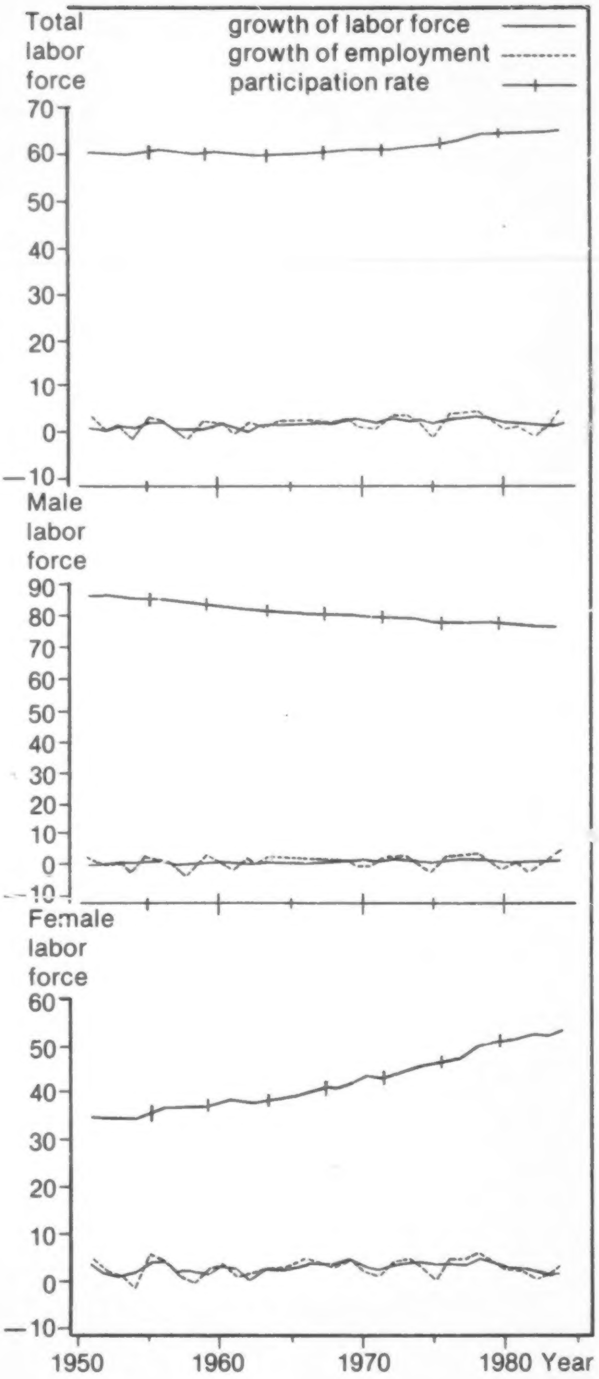
It is no surprise that each of the categories has grown substantially since 1950. It is also no surprise that the male and female components of each category have grown as well. President Reagan is fond of documenting this fact by proclaiming that more people are employed than ever before. With few exceptions, each president since Eisenhower could have made the same statement.

What may be surprising to some is the level of growth in each of the categories. In 1950, there were 106 million people in the United States aged 16 and over, 54 million women and nearly 52 million men. In 1984, the population was 178 million, with 93 million women and 85 million men. The total growth in the 1950–1984 period was 68 percent, or 1.53 percent per year, with the female portion growing slightly faster than the male portion. The growth of the labor force was very different. The total labor force grew 82 percent from 63 million in 1950 to 115 million in 1984. While the male portion grew only 45 percent from nearly 45 million to 65 million, the female portion nearly tripled from 18.5 million to nearly 50 million. In another light, labor force participation rates can be compared. (This is the size of the labor force divided by the population.) While the total labor force participation rate grew from 59.7 percent in 1950 to 64.7 percent in 1984, the male participation rate fell from 86.7 percent to 76.8 percent, and the female participation rate grew from 33.9 percent to 53.7 percent.

Many reasons have been given for the dramatic increase in the labor force particiption rate of women. Rising real wages in the 1960s have been cited as one reason, although this does not explain why the male participation rate fell over the same period. The rising real wage argument also does not account for the continued increase in female participation in the late 1970s and early 1980s when real wages were no longer rising. A desire for greater family disposable income is also cited as a reason to draw the housewife into the market to supplement her husband's income. The increase in the number of single parents and the increasing independence and equality that women have gained in the past few decades may also be reasons. Regardless of the reason, the rapid increase of women in the labor force has had a profound effect on increased employment and unemployment. If adequate job growth does not accompany labor force growth, higher unemployment will occur.

The absolute levels of employment and unemployment have also grown since 1950, but not as consistently. Employment, which was 60 million in 1950 and 107 million in 1984, grew in all but four years. These four years of employment decline can each be linked to a recessionary period. And contrary to what President Reagan has stated thoughout his presidency, 848 thousand fewer people were employed at the end of his first term. Large periods of employment growth can be linked to the recovery periods immediately following these recessions and during the height of the Vietnam War. Absolute unemployment has also shown long-term growth but with many short-term fluctuations. While more than half of the 35 years since 1950 have had lower unemployment than the previous year, unemployment has grown from 3.3 million in 1950 to 3.85 million in 1960; 4.1 million in 1970, and 8.5 million in 1984. The whole range of labor force and unemployment data is shown on the Chart.

The textbook explanation for unemployment is chiefly concerned with the failure of the prevailing wage level to decrease enough to create an equilibrium of supply and demand in the labor market. The argument is that because wages are too high more people want employment than employers are willing to hire. Social conditions and market inadequacies prevent this simplistic view from completely explaining unemployment, but it probably accounts for some of it. Many are unemployed because a lack of product demand or surplus product inventories have lowered the demand for production employees. The slow downward adjustment of wages accompanying a decline in labor demand prevents enough people from joining the "not in the labor force" group to cause equilibrium in the labor market, or at least lower unemployment. This is then an over supply of labor.



Alternative Scenario

The previous section outlined the status of labor supply in the United States since 1950. It is clear that the labor force has grown rapidly, especially the female portion. In this section, alternative evolutions the of labor force will be constructed and analyzed. After labor force growth is artifically altered, it will be compared to the number of jobs available and an artificial unemployment level will be computed. Labor force growth will be restricted to levels lower than those that prevailed historically. The number of jobs available will be calculated by adding 5 percent of the labor force to the number employed each year. Finally, the male and female portions of each group will be analyzed.

These "what if" scenarios are not designed as realistic possibilities but rather to highlight the importance labor force growth has had on the unemployment rate. Any labor force study suffers from errors in the collecting and reporting of data, but this study has some unique imperfections. Restricting the labor force to a fixed percentage of the population and making a statement about unemployment assumes that workers are completely homogeneous and interchangeable, which is unrealistic. Calculating the number of jobs available is fairly straightforward. Clearly, one job exists for each person employed, and five percentage points of the unemployment rate is often comprised of people termed frictionally employed—unemployed for whom jobs exist, but who have not yet found those jobs. The count of existing jobs, coupled with restricted participation rates, probably overstates the level of existing jobs, because part of the employment created was not independent of the rising labor force participation rate.

Three different cases were divised. The first calculated the labor force level that would have accomodated full employment (five percent unemployment or the true rate, whichever was less). The second case fixed the labor force participation rate for the male and female categories at each's 1950 level. That is the same as allowing each component of the labor force to grow at the same rate as its respective population component. The final case maintained the male participation rate at its true level and allowed the female labor force to grow at the same rate as the population, plus one percent. The results of each case are documented in the Table.

Calculating the labor force that would be required to maintain full employment provides a basis for further study. It is always less than or equal to the existing labor force, by definition, but its size varies from year to year. The unemployment level has exceeded full employment (five percent unemployed) in 22 of the 35 years since 1950. It is only since 1975, however, that unemployment has reached high levels and not subsequently declined. In seven of those ten years the labor force would have had to be more than two million workers smaller to achieve full employment; in the last four, it would have had to be at least by 2.9 million smaller. This difference between the size of the labor force and the labor force required for full employment measures the oversupply (or underdemand) of labor. It is not a trivial amount that can be alievated by simple solutions.

In an attempt to view unemployment at least partially as an oversupply, two cases of restricted supply were created. Because the male participation rate has declined since 1950 and the female rate increased, fixing each participation rate at its 1950 level causes the male labor force to be higher than its true level and the female labor force to be lower than its true level. The smaller female labor force dominates the larger male labor force, producing a net decline in the total labor force. More important, given the number of jobs that would exist, a net decline in unemployment would take place. The decline in unemployment would be so dramatic that in 1984 there would have been 1.3 million jobs for which there was no employee. Since 1965, the unemployment rate would have exceeded three percent only once and would have been negative (more jobs than laborers) in five of the seven years between 1978 and 1984. This method of calculating the labor force and existing jobs in each's male and female components gives rise to a component unemployment rate that is interesting, but essentially meaningless, in terms of the economy. Female unemployment rates are calculated as negtive since 1955, and male rates are double digits since 1970. Allowing any worker to work any job, combines the two levels and recaptures the study's impact.

The final case focuses on the female labor force. It also provides for more realistic labor force growth by women, but growth that is still slower that the true rate. The results are similar to those of the first case. Slower growth of the female labor force would have created a lower overall unemployment rate. The decline in unemployment would not have been trivial. With fewer females in the labor force, as many as 5 million jobs would have been freed for unemployed males to fill. Often there would not have been enough males to fill all the positions. Since 1966, unemployment would have reached the two percent level only in 1975, when it would have been an "extreme" 3.12 percent.

From these scenarios, one can conclude that the increase in unemployment is not just a problem of lack of demand.

Table. Actual Labor Force Statistics and Simulation Results, 1950–84

	Population (1)	*Labor Force (1)*	*Labor Force Participation Rate (1)*	*Unemployment Rate (1)*	*Labor Force (2)*	*Labor Force Participation Rate (2)*	*Unemployment Rate (3)*	*Unemployment Rate (4)*
1950	106,164	63,377	59.7	5.19	63,249	59.6	5.19	5.19
1951	106,764	64,160	60.1	3.20	65,373	61.2	2.29	2.84
1952	107,617	64,524	60.0	2.93	65,933	61.3	2.07	2.56
1953	109,287	65,246	59.7	2.81	66,747	61.1	2.45	2.45
1954	110,463	65,784	59.6	5.37	65,527	59.3	5.24	5.01
1955	111,747	67,087	60.0	4.25	67,615	60.5	3.36	3.24
1956	112,919	68,516	60.7	4.02	69,225	61.3	2.04	2.33
1957	114,213	68,877	60.3	4.15	69,494	60.8	2.74	2.45
1958	115,574	69,486	60.1	6.62	68,298	59.1	5.51	4.95
1959	117,117	70,157	59.9	5.33	69,914	59.7	4.52	3.62
1960	119,106	71,489	60.0	5.39	71,199	59.8	4.37	3.47
1961	120,671	72,360	60.0	6.52	71,206	59.0	5.54	4.60
1962	122,214	72,674	59.5	5.38	72,382	59.2	5.16	3.43
1963	124,422	73,839	59.3	5.51	73,440	59.0	5.47	3.54
1964	126,503	75,109	59.4	5.04	75,077	59.3	4.91	3.00
1965	128,459	76,402	59.5	4.41	76,878	59.8	4.06	2.19
1966	130,180	77,893	59.8	3.69	78,965	60.7	2.64	.90
1967	132,092	79,565	60.2	3.74	80,621	61.0	1.92	.53
1968	134,281	80,990	60.3	3.48	82,287	61.3	1.48	.15
1969	136,573	82,972	60.8	3.38	84,389	61.8	.62	–.59
1970	139,203	84,889	61.0	4.82	85,048	61.1	1.75	.71
1971	142,189	86,354	60.7	5.81	85,621	60.2	3.21	1.72
1972	145,939	88,847	60.9	5.49	88,385	60.6	2.62	1.26
1973	148,870	91,202	61.3	4.79	91,408	61.4	1.28	.13
1974	151,841	93,671	61.7	5.50	93,174	61.4	1.36	.44
1975	154,831	95,452	61.6	8.31	92,131	59.5	4.34	3.12
1976	157,818	97,825	62.0	7.57	95,179	60.3	3.06	1.87
1977	160,689	100,664	62.6	6.95	98,603	61.4	1.39	.63
1978	163,541	103,882	63.5	5.97	102,820	62.9	–1.04	–1.31
1979	166,460	106,558	64.0	5.76	105,706	63.5	–2.05	–1.99
1980	169,349	108,543	64.1	7.04	106,218	62.7	–.80	–.74
1981	171,775	110,315	64.2	7.50	107,413	62.5	–.50	–.40
1982	173,939	111,873	64.3	9.55	106,520	61.2	1.57	1.75
1983	175,891	113,226	64.4	9.47	107,905	61.3	1.44	1.63
1984	178,080	115,241	64.7	7.41	112,318	63.1	–1.31	–.78

(1) Actual. (2) Labor force to accomodate full employment. (3) Unemployment when labor force grew at the rate of the population. (4) Unemployment when the female labor force grew at the rate of the female population plus one percent and the male labor force was unchanged.

Conclusions

Since 1950, periods of relatively high unemployment have been followed by recovery periods of nearly full employment. Because the high unemployment of the 1980s has not been decreased to nearly full employment, many have questioned what characteristics of this period are different from other periods of high unemployment. While it can be argued that the economy's failure to stimulate job growth causes unemployment, this argument may not totally explain the entire unemployment situtation today.

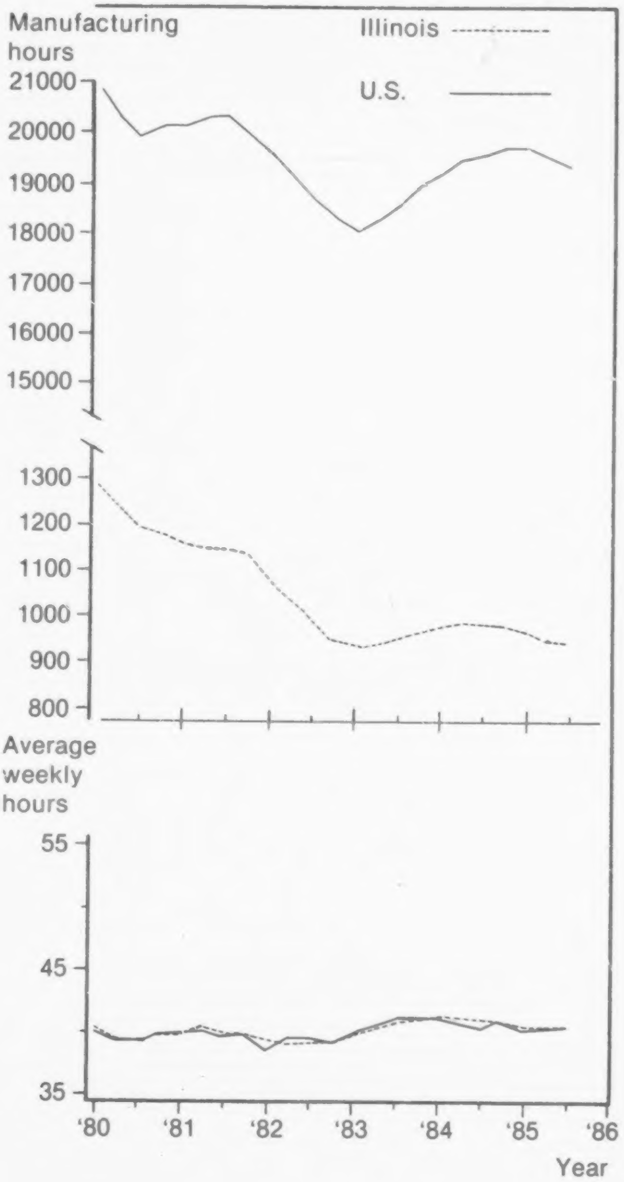
In light of labor force growth since 1950, this explanation may be correct for the period before 1975, but not necessarily so since. Instead, another view of unemployment is that labor supply is too large. Typical reasons for entering the labor force, such as rising real wage rates, have not existed, in general, since 1975, but the labor force has continued to grow just as it did before 1975.

To highlight the oversupply of labor, two artifical labor forces have been created that reflect possible ways that the labor could have evolved since 1950. In both cases, had the labor force grown at slower rates, especially the female portion, the level of unemployment would be much smaller than it is today. It would be so much smaller in fact, that in some years there would have been jobs with no workers to fill them.

This study has concentrated on labor force growth, particularly the growth of women in the labor force. The conclusion drawn is that if the labor force had not grown as fast as it did, the unemployment level would now be much lower. Some may see this as placing the blame for unemployment on women, but that is neither the purpose of the study nor a valid conclusion. Instead, the conclusion simply suggests that the current period of high unemployment might be better understood if the increase in the labor force since 1975 could be adequately explained. ●

Illinois Economic Outlook *(see facing page)*

In the last issue of the *Illinois Business Review*, we presented employment forecasts. In revising the Illinois Econometric Model, lagged average weekly hours have proven to be a valuable predictor for employment. Therefore, it is important to have good forecasts of average weekly hours to drive the employment forecasts. This month, then, historical average weekly hours for the United States and Illinois, as well as Illinois forecasts, are presented.



Illinois Economic Forecasts, Average Weekly Hours (1984:IV–1987:I)

United States	*84:II*	*84:III*	*80:IV*	*80:I*	*85:II*	*85:III*
Manufacturing	35.3	35.2	35.2	35.1	35.1	35.0
Durable goods	41.5	41.3	41.7	40.7	41.1	41.1
Primary metals	41.8	41.3	41.4	41.1	41.2	41.5
Fabricated metals	41.4	41.2	41.5	41.0	41.1	41.2
Nonelectrical equipment	41.9	41.7	42.1	41.5	41.2	41.3
Electrical equipment	41.0	40.8	41.2	40.6	40.3	40.3
Miscellaneous durables	41.3	41.1	41.5	41.0	41.2	41.3
Nondurable goods	39.7	39.5	39.6	39.2	39.2	39.6
Food products	39.8	39.6	39.8	39.7	39.8	40.1
Printing and publishing	37.9	37.9	38.0	37.5	37.4	37.8
Chemical products	41.9	41.8	42.0	42.0	41.9	41.8
Miscellaneous nondurables	39.7	39.4	39.5	39.2	39.3	39.6

Illinois	*84:II*	*80:III*	*80:IV*	*85:I*	*85:II*	*85:III*	*85:IV*	*86:I*	*86:II*	*86:III*	*86:IV*	*86:I*
Manufacturing	41.2	40.9	40.7	40.4	40.4	40.5	40.5	40.3	40.3	40.3	40.2	40.2
Durable goods	41.4	41.1	40.9	40.5	40.6	40.8	40.8	40.7	40.7	40.7	40.7	40.7
Primary metals	42.5	41.9	41.6	40.6	41.0	41.3	41.2	41.1	41.1	41.1	41.0	41.0
Fabricated metals	41.6	41.2	41.1	41.0	41.2	41.9	41.9	41.7	41.7	41.7	41.5	41.5
Nonelectrical equipment	41.4	41.3	41.1	41.2	40.7	41.1	40.9	40.7	40.7	40.6	40.5	40.4
Electrical equipment	40.9	40.2	40.1	39.9	39.4	39.5	39.6	39.6	39.7	39.8	39.8	39.8
Miscellaneous durables	41.3	41.1	40.5	40.1	40.6	40.1	39.9	39.9	40.0	40.1	40.1	40.2
Nondurable goods	40.8	40.6	40.4	40.2	40.2	40.1	40.2	40.1	40.1	40.1	40.0	40.1
Food products	41.7	41.0	40.8	40.8	40.9	41.0	41.7	41.5	41.6	41.7	41.6	41.6
Printing and publishing	38.3	38.6	38.5	38.0	37.3	37.2	37.4	37.5	37.7	37.9	37.8	37.9
Chemical products	41.4	42.0	41.9	41.4	41.2	40.4	40.6	40.7	40.8	40.9	41.0	41.0
Miscellaneous nondurables	41.4	41.1	40.8	40.8	41.4	41.4	41.2	40.9	40.8	40.8	40.6	40.6

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ILLINOIS BUSINESS INDEXES

	Percent Change Nov 1984-Nov 1985	*Nov 1985*	*Oct 1985*	*Sept 1985*	*Aug 1985*	*Nov 1984*	*Oct 1984*
Coincident Indicator (1969 = 100)	8.96%	119.54	120.35	126.68	125.21	109.71	109.41
Employment-manufacturing (in thousands);[e]	–3.96%	944.6	948.3	949.7	952.4	983.5	989.6
Average weekly hours-manufacturing;[e]	0.73%	41.3	40.8	40.9	40.4	41.0	40.7
Weekly earnings-manufacturing;[e]	3.89%	$435.30	$429.62	$428.63	$420.56	$419.02	$413.92
Help wanted advertising-Chicago (1969 = 100);[a]	4.04%	103	96	95	98	99	100
Help wanted advertising-St. Louis (1969 = 100);[a]	0.00%	64	64	67	65	64	59
Retail Sales (in millions);[b]	–0.42%	$5,174	$5,342	$5,217	$5,512	$5,196	$5,138
Coal production (in thousands)	–9.39%	4,198	5,714	5,193	5,384	4,633	5,633
Petroleum products (in thousands);[e]	6.18%	2,629	2,717	2,545	2,645	2,476	2,623
Vendor performance	–16.00%	42.0%	46.0%	42.0%	42.0%	50.0%	52.0%
Building permits (in thousands)							
Residential housing units	20.98%	2.751	3.316	3.554	4.055	2.274	2.813
Value of Residential housing	21.50%	$157,000	$211,277	$207,827	$219,135	$129,223	$151,004
Value of nonresidential construction							
Industrial buildings	105.00%	$30,241	$34,849	$26,517	$30,617	$14,752	$15,685
Office, banks, and professional buildings	–25.08%	$26,582	$74,525	$31,665	$64,984	$35,482	$43,040
Stores and other mercantile buildings	–0.53%	$15,694	$35,041	$34,035	$25,516	$15,777	$24,621
Other	29.97%	$3,534	$4,502	$3,507	$5,540	$2,719	$4,577
Consumer price index (December 1977 = 100)							
North Central US;[c]	2.52%	—	174.9	—	174.3	—	170.6
North Central/population more than 1,250,000;[c]	2.77%	—	178.2	—	178.3	—	173.4
North Central/population 385,000 to 1,250,000;[c]	2.66%	—	173.4	—	171.5	—	168.9
North Central/population 75,000 to 385,000;[c]	1.73%	—	170.1	—	159.1	—	167.2
North Central/population less than 75,000;[c]	2.45%	—	171.6	—	170.7	—	167.5
Chicago (1967 = 100)	3.28%	324.2	322.6	326.3	325.9	313.9	314.1
St. Louis (1967 = 100)	4.04%	321.6	—	321.6	—	309.1	--
		1985:II	1985:I	1984:IV	1984:III	1984:II	1984:I
Personal income (in millions)[d,e]	6.51%	$166,908	$164,894	$162,200	$160,180	$156,710	$153,752
Per capita personal income[d,e]	5.28%	$14,311	$14,148	$14,024	$13,871	$13,593	$13,386

[a] The Conference Board, *Help Wanted Advertising*, Nov. 1985.; [b] Latest month projected by BEBR.; [c] Percent change between October 1984 and October 1985.; [d] Percent change between 1984:II and 1985:II.; [e] Recent month is preliminary figure.

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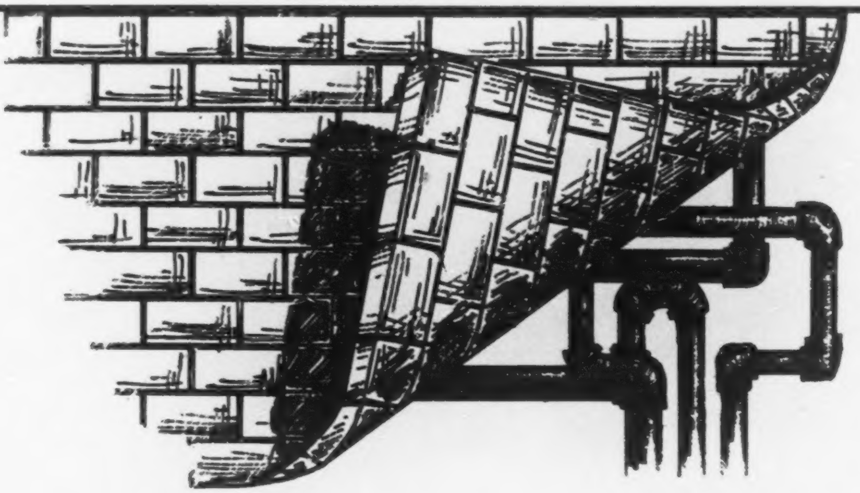

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DEBBIE MUSTELL

Infrastructure Investment in Build Illinois

State government investment in infrastructure is expected to increase in 1986 and in the three years following, due mainly to the Governor Thompson's extensive Build Illinois program. The infrastructure component of this program provides new or supplementary funds to four areas of the Illinois infrastructure: water and sewer treatment grants, highway systems, rail freight grants, and flood control. Of these four areas, programs relating to water and sewers gain the biggest share of the total spending this year as well as in the subsequent years of the program. Of $78 million originally proposed in February 1985 for infrastructure improvement in fiscal year 1986 (1 July 1985 to 30 June 1986), $68 million (87 percent) was earmarked for sewers and highways. Of this amount, $50 million went to water and sewer treatment grants. The final bill signed by Governor Thompson in late summer differed somewhat from the program as originally proposed. Furthermore, the bill provides expenditures of substantially more than the $2.3 billion total the legislature has approved; because of this the Governor has appointed a task force headed by Lieutenant Governor Ryan to review the projects and to revise the spending total so that it meets the approved amount.

However, the Governor's office expects the *relative* levels of expenditures to remain unchanged from the original program, even though the dollar amounts on individual projects may be altered.

The purpose of the planned infrastructure investment is to enhance the attractiveness of Illinois communities to new and expanding businesses. It is argued that adequate sewage facilities, accessibility to highways and rail lines, and the like, are positive factors in stimulating new business formation, the expansion of existing industry, or hopefully, a combination of both. Because the program would make Illinois increasingly competitive, the long-run result would involve additional jobs or retention of existing jobs, greater state personal and business income, and, therefore, a better state economic base. Considerations such as these underlie an emphasis on infrastructure renovation in Build Illinois. Infrastructure programs get approximately 57 percent (exclusive of the housing portion of the program) of the five-year total proposed outlay. The need for this action at the state level has been further emphasized because of the reduction of assistance of this sort from the federal government. Federal funding has been on the decline since 1981 and is expected to decline further. Though state funding in these areas has increased, more effort is required to finish the needed improvements.

In the area of water and sewer treatment grants, the FY 85 increases allowed 55 communities to carry on improvements to comply with clean water standards or allow for their community's future growth. To begin similar projects, Build Illinois will grant funds to an additional 43 communities. For new projects that are proven to relate to business development in the community, funding will be administered by the Department of Commerce and Community Affairs and the Illinois Environmental Protection Agency. For such funding, the community needs to show that new business formation or expansion is contingent on the completion of the water/sewage facility and that the economic development would not take place without the help of state funds. The program does not provide for communities getting businesses that are merely relocating from a different area of the state, since this just transfers jobs and does not create new ones. In addition to the emphasis on job creation and economic development, communities that demonstrate a willingness and ability to leverage local funds in the completion of the project will be favored when grant money is awarded.

A second major part of Illinois' infrastructure emphasized in Build Illinois is the state highway system. It was proposed that a total of $372 million be spent to supplement funds that provide for improvements to US 51, US 36, and Thorndale Avenue in Du Page County, the development of access roads and new interchanges for existing highways, and the addition of three highway rest areas. These measures—which improve accessibility to labor and product markets, shipping lanes, and the like—could possibly attract new businesses to the surrounding areas and, therefore, spur economic development. In FY 86, $18 million dollars was proposed to be directed toward these goals to supplement the more than $650 million invested so far and the $250 million included in the existing FY86 to FY89 program administered by the Department of Transportation.

The state's rail freight system is expected to be reduced by 1,000 miles by 1990, due in part to the decline in federal aid. The original Build Illinois program provided $25 million over its five years ($5 million annually) to help slow the abandonment of rail lines. The Thompson administration estimates that 15,000 to 20,000 jobs will either be created or saved by

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the retention of these rail lines. Thought of in these terms, the program will cost the state $1,250 to $1,667 per job.

The last component of infrastructure investment included in Build Illinois is flood control. The program directs $5 million annually for 5 years to the improvement of levees, deepening of channels, and modifying of spillways in seven counties, mostly in the area around Cook County. The administration estimates that $1.3 million will be saved annually by these measures, which means that the projects will take about 19 ($25 million ÷ $1.3 million) years to pay for themselves, not taking any inflation into account.

Economic development and the creation or retention of jobs has been emphasized time and again in Build Illinois. How likely are these to occur and when? In the short run, Build Illinois will definitely create jobs. As spending under the program takes off, construction workers, engineers, and so on, will be employed to design and install the new roads, sewers, and improve the existing rail lines and flood control facilities. However, the long-run growth in jobs is tied to the economic development aspect of the program. As was seen in the much-publicized case of the Saturn plant, a company thinks and evaluates a long time before deciding where to locate a new facility. To be sure, the measures included for infrastructure improvement are a major consideration for a relocating or expanding firm. However, it takes time to make the improvements and time to build plants (both of which, of course, create jobs) before actual production begins and the permanent employment can take place. In other words, the long-run employment prospects associated with Build Illinois are very tenuous, contingent on many factors. Further, will the kind of industry Illinois is trying to attract enjoy long-term growth? These investments may attract firms that are subject to major cyclical swings, such firms as are already abundant in the state.

Personal and business income will go up in the short run also, as the Build Illinois funds are received as income by businesses making the proposed improvements and their employees. But it is difficult to estimate how much of that money remains in the state after the initial spending.

In summary, the Build Illinois program will most likely help the state in the short run, as the federal government projects helped the national economy during the depression. The long-term effects on employment and economic development, however, are difficult to forecast because growth or economic expansion is dependent on many factors other than sewers and highways. However, infrastructure investment will not hurt, and it may very possibly help, in the long run. ▲

REAL ESTATE DEVELOPMENTS

HUN Y. PARK

Using Futures Markets to Hedge Interest Rate Risk: The Search for the Optimal Hedge Ratio

The value of a mortgage is crucially dependent on the level of interest rates. The higher the interest rate, the less valuable will be the stream of future payments associated with the mortgage and vice versa. For this reason, the more volatile environment for the interest rates, the more risky will be activity in the mortgage industry. Savings and loan associations (S&Ls) make 30-year mortgages at fixed rates; mortgage bankers make 90-day mortgage rate commitments. The more uncertain the environment, the riskier is the business in which these two firms engage. Given that the interest rates are more unstable than they were 10–15 years ago, many participants in the mortgage market have done what farmers did long ago—turn to the futures market to reduce the riskiness of their business.

The risk-reducing strategy employed in the futures market is quite simple. The investor sells a futures contract on a particular commodity at the same time he buys that particular commodity in the spot market (today's market) and vice versa. For example, an S&L that makes a loan today is essentially buying a mortgage contract at the current market price—the loan minus points. In return for this single payment the S&L receives a series of monthly mortgage payments. To reduce the riskiness of the transaction, the S&L can sell a futures contract on the same type of mortgage. If the strategy works perfectly, any decreases in the value of the mortgage contract owing to higher interest rates would be offset completely by the increases in the value of the futures contract.

How to Use the Futures Market to Reduce Interest Rate Risk

	Spot Market	*Futures Market*
Oct. 1	Issues $100,000, 20-year, 8% mortgage priced at $86.00 (yield 9.58%)	Sell .92 GNMA futures contracts priced at $86.875 (yield 9.475%)
Nov. 1	Price for mortgage falls to $84.00 (yield 9.84%)	Price for a GNMA futures contract falls to $84.701
	Loss: $2,000	Gain: .92(86.875–84.701) = $2,000

The preceeding example shows this in increased detail. On October 1 an S&L issues a $100,000, 20- year, 8 percent mortgage priced at $86.00 yielding 9.58 percent. To protect itself from a loss due to a rise in the interest rate, the S&L may sell a .92 December GNMA futures contract priced at $86.875 (each contract has a principal value of $100,000). Suppose that by 1 November interest rates have risen and, therefore, mortgage value and futures prices have dropped to $84.00 and $84.701, respectively. At that point the S&L's futures market account will show a position balance of $2,000. The loss in the spot market will have been entirely offset by the gain in the futures market.

The key to this strategy is a knowledge of what is called the hedge ratio. The hedge ratio indicates the number of futures contracts that must be sold per contract bought in the spot market (that is, mortgages made) to achieve a complete hedge. As it turns out, the hedge ratio equals the correlation between spot prices and futures prices (more correctly, the ratio of changes in spot prices to changes in futures prices). In the example just discussed, the hedge ratio is .92 because it is believed that spot prices will change by only 92 percent of the change in futures possible prices, the case of an S&L or a mortgage banker needs to sell .92 futures contracts for each mortgage made.

The exact value of the hedge ratio may not be very important. A person can pursue sound hedging strategies regardless of the number. *What is crucial is the stability of the ratio over time.* If the relationship between spot and futures prices is highly volatile, the investor will need to be continually altering his holdings of futures contracts. Even then, the volatility makes it unlikely that the hedge will be perfect.

Several studies have attempted to estimate the optimal hedge ratio for mortgage interest rates. The standard procedure entails computing the ordinary least squares (OLS) estimate of the coefficient of the futures price in a regression with the spot price as the dependent variable. An excellent example of this approach is contained in ORER paper #14— "Further Tests of the Effectiveness of Cross Hedging among Mortgage and Futures Markets" by George Gau and John Markese. Unfortunately, one conclusion of this research is that the OLS estimates are not particularly stable. Thus, hedging strategies based upon these estimates will be less than perfect; sometimes too many futures contracts will be bought and sometimes too few. Certainly, these strategies will result in a less risky portfolio than a strategy that does nothing to reduce mortgage interest rate risk; but they will not eliminate such risk.

The purpose of this article is to explore the reasons for this variability in the hedge ratio and to identify techniques for obtaining improved estimates. Previous estimation techniques have ignored an important determinant of futures prices—error-learning behavior, As a consequence, OLS estimates are likely to be imprecise. It is also shown that estimates based upon an alternative technique that takes this error-learning behavior into account produces more precise estimates of the hedge ratio. Hence, hedging strategies that make use of the hedge ratio estimates produced by this technique are likely to be more successful than those based on the simpler and less reliable OLS technique.

The next section discusses how forecast errors are likely to affect the relationship between futures and spot prices. The third section discusses the alternative estimation procedure and the results obtained. The final section briefly summarizes the conclusions of this article and indicates other problems that still must be solved before the futures market can be considered to be a completely successful tool for hedging mortgage interest rate risk.

The Stability of the Hedge Ratio over Time

The major reason that futures contracts can be used as a hedging instrument is the fact that the market perceives futures prices in general as proxies for expected spot prices in the future. However, effective use of futures contracts requires an investigation of how futures prices are formed and how they change over time.

The market formulates expectations of future interest rates based on available information. The market will revise its expectations as new information becomes available. There is a view that recent forecasting errors are of major importance in formulating revisions of expectations. The traditional expectations hypothesis of the term structure of interest rates asserts that if the actual rate is higher than what has been anticipated so that the forecasting error is positive, the market will revise its expectations upward. Similarly, if the forecasting error is negative, the market will revise its expectations downward.

To demonstrate the relevance of this revision process, the relationship between changes in futures rate and unanticipated changes in spot interest rate is

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explained. Table 1 summarizes the synchronization of three-month Treasury bill futures and unanticipated changes in three-month spot rates classified by forecasting periods. Settlement prices of cash Treasury bill and T-bill futures contracts as of Thursday of the third week of each month are used in order to match as closely as possible the delivery date for T-bill futures for the period of June 1976–August 1983. The forecasting error (that is, unanticipated changes in three month rates) is calculated by subtracting the three-month T-bill futures rate from the actual spot rate (for example, the difference between three-month T-bill rate at time t and three-month T-bill futures rate observed at time $t-1$).

The results in Table 1 suggest that futures rates and the forecasting error tend to move in the same direction across forecasting periods. For example, when the forecasting period is three months, whenever the forecasting error is negative, the market revises downward its expectations of future interest rates (12 out of 12). When the forecasting error is positive, expectations are revised upward 82.4 percent of the time (14 out of 17). These results, supporting the conventional expectation hypothesis albeit indirectly, indicate that changes in futures prices (or rates) depend on the forecasting error.

What is the implication of this adaptive mechanism of futures prices to the problem of estimating the hedge ratio? In the regression-based hedge ratio model, the historical relationship between changes in cash and futures prices are assumed stable. For example, an optimal hedge ratio of .92 means that a $1 change in the futures price results in a $.92 change in the spot price. However, if futures prices are not random and independent of the error term in this regression, then OLS estimates of the relationship between futures and cash prices will be biased and imprecise.

This means that investors should be cautious when they use simple regression to estimate the optimal hedge ratio. This is particularly true for periods of volatile interest rates since forecasting errors are likely to be larger.

An Improved Hedge Ratio

The point of the last section is that OLS estimates of the hedge ratio may be quite misleading. This does not mean that futures markets cannot be used; rather, it means that hedging based upon OLS estimates of the hedge ratio are likely to be inferior to strategies that employ estimates obtained using more sophisticated procedures. This section discusses estimates based upon an alternative procedure—nonlinear estimation. The full details of this approach are discussed in a forthcoming ORER paper; here attention is focused on the intuition underlying the alternative procedure and how hedging strategies using estimates based upon this procedure perform relative to those based upon OLS estimates.

One way of capturing the complex relationship between futures and spot prices noted in the last section is to investigate whether the relationship between the changes in the cash and futures prices is nonlinear. The conventional regression-based hedge ratio may misrepresent the true ratio when interest rates have been volatile and generally low or high relative to the current position.

Chart 1 exemplifies the dissimilar interest rate risk characteristics. Suppose that the relationship between the changes in the cash (ΔS) and futures prices (ΔF) is best fitted by a curved line, CC', in Chart 1. It is easily noticeable that the optimal hedge ratio depends partly on where the current position is located. When the interest rate increases so that the changes in the cash and futures prices are negative and the current position is the point A, the hedge ratio from the linear line (LL'), if applied to the current position, A, overstates the interest rate sensitivity of the cash security. That is, the slope of the curved line at A is lower than the slope of the linear line and, thus, causes the hedger to short too many futures contracts. On the other hand, when the interest rate decreases and the current position is the point B, the straight line fitting to the point, B, gives the hedge ratio that understates the interest rate sensitivity of the cash security relative to the futures contract and thus causes the hedger to short too few futures contracts.

Chart 1. Dissimilar Interest Rate Risk

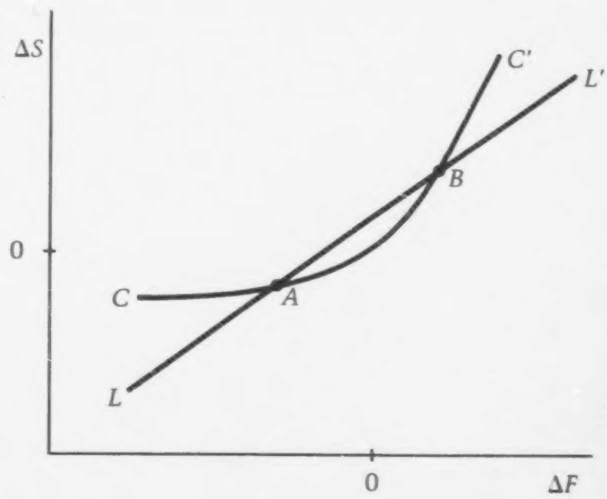

Table 1. Synchronization of Futures Interest Rate and Forecasting Errors Classified by the Forecasting Period*

1. When the forecasting error is negative.

	Number of times in the future at which futures rate is applicable								
n	3	6	9	12	15	18	21	Total	
Increased	0	1	2	2	2	2	3	12	(15.4%)
Unchanged	0	1	0	0	1	0	0	2	(2.5%)
Decreased	12	10	10	10	9	7	6	64	(82.1%)
Total	12	12	12	12	12	9	9	78	(100%)

2. When the forecasting error is positive.

n	3	6	9	12	15	18	21	Total	
Increased	14	13	13	12	11	9	9	81	(73.6%)
Unchanged	0	1	0	0	0	1	1	3	(1.8%)
Decreased	3	3	4	4	4	4	4	26	(23.6%)
Total	17	17	17	16	15	14	14	110	(100%)

*n represents the forecasting period (months).

Table 2. Estimated Hedge Ratios*

Time to Maturity (Months)	*Two Week Hedging*				*Four Week Hedging*			
	Linear	R^2	*Non-linear***	R^2	*Linear*	R^2	*Non-linear***	R^2
Nearby	.9305 (.0487)	.7342	.9182 (.0480)	.7456	.9600 (.0609)	.7842	.9456 (.0562)	.8050
3-6	.9245 (.0493)	.7259	.9038 (.0491)	.7383	.9521 (.0595)	.7883	.9351 (.0590)	.8100
6-9	.9391 (.0512)	.7168	.9110 (.0494)	.7298	.9640 (.0616)	.7807	.9434 (.0599)	.8030
9+	.9495 (.0534)	.7023	.9122 (.0528)	.7158	.9733 (.0642)	.7696	.9475 (.0600)	.7926

*The numbers in parentheses represent standard errors.

**The estimates of the hedge ratio for the non-linear model are evaluated at mean values.

Table 2 compares the hedge ratios based on the linear line and the curve for two-week and four-week hedging for GNMA. The Chicago Board of Trade began trading GNMA futures on 19 September 1918. The contracts are priced to the GNMA certificates— $100,000 face value of 30-year single family home mortgages with an assumed coupon rate of 8 percent, which is assumed to be prepaid at the end of the twelfth year. Daily closing spot and futures prices of GNMA are used. The spot prices also based on an average 12-year prepayment and 30-year mortgage terms with 8 percent coupon rate. To allow the market to gain some depth, the data for the period, 1 September 1979 through 31 January 1985 are used. Also, the sample is divided into four categories to examine the effect of the time maturity on the hedge ratio. The four categories are: nearby, three-to-six-month, six-to-nine-month, and longer-than-nine-month contracts.

The results in Table 2 indicate that the hedge ratio estimates based on the nonlinear relationship between cash and futures price changes are much lower than those based on the simple assumption of the linearity of the two prices. This implies that the conventional method of estimating the hedge ratio assuming the linearity between cash and futures prices changes causes investors to short too many futures contracts. Note also that the standard errors of the hedge ratio estimates based on the nonlinear relationship are somewhat lower than those based on the linear regression line. This means that the hedge ratio based upon the nonlinear relationship is more precise, and, thus, the confidence of investors in the hedge ratio can be enhanced. Note, too, the R^2s are larger for the nonlinear model. This means that the explanatory power of the nonlinear model is larger, thus hedging strategies based upon the nonlinear model will tend to be more successful.

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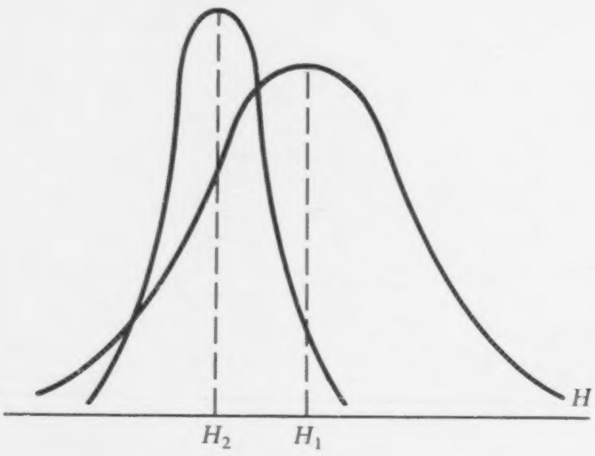
Chart 2 shows two simplified distributions of hedge ratios, one on the simple assumption of linearity between cash and futures prices yielding the hedge ratio H_1, and the other taking into account the dissimilar interest rate risk between the two securities yielding the hedge ratio H_2 with less uncertainty. Indeed, Chart 2 indicates that a procedure that takes into account such a changing relationship might do a superior job to one that does not.

Chart 2. Comparison of Hedge Ratios Based on Linear and Nonlinear Relationships



Conclusions

Futures markets offer investors an opportunity to reduce interest rate risk, but the success depends on the estimate of the hedge ratio, that is, the relationship between changes in spot and futures prices. Estimates based upon an alternative procedure are shown to be more stable over time and more precise. These estimates will lead to more successful strategies.

This article has focused on one problem associated with using the futures market—the estimation of the hedge ratio. Others have not been addressed. Two others are particularly important. One, there is a "basis risk" owing to the fact that mortgage contracts are not all identical, thus the mortgages being hedged may not be closely aligned with the futures contracts available. This risk is a direct result of the heterogeneity of mortgages. Investors must be aware that the success of a hedging strategy depends on how closely the mortgage underlying a futures contract—a fixed rate, 30-year FHA mortgage—matches the type of mortgage being issued. For example, the basis risk is larger for a graduated payment mortgage than for a 20-year FHA fixed-rate mortgage.

Two, the fact that borrowers can prepay their mortgages as interest rates decline implies that investors are not fully protected. In particular, if interest rates decline and prepayments rise, the value of the mortgage will not increase by as much as the futures contract declines. Although some work has been done to show how other securities such as options can be used to limit prepayment risk, it is fair to say that more research in this area is needed. ▲

Hun Y. Park is an assistant professor in the Department of Finance, University of Illinois at Urbana-Champaign. This research was supported by the Office of Real Estate Research, University of Illinois at Urbana-Champaign. The helpful suggestions of James Follain are gratefully acknowledged.

ORER Paper Series

Each issue of the *Illinois Business Review* contains an article dealing with some aspect of the real estate market. Most are based upon research projects sponsored by the Office of Real Estate Research (ORER). ORER-sponsored research is also published in the ORER Paper Series. Recent papers include:

Paper No.	Author/Title
20	Joseph C. Kowalski and Peter F. Colwell, "Market Versus Assessed Values of Industrial Land."
21	Chunchi Wu and Peter F. Colwell, "Equilibrium of Housing and Real Estate Brokerage Markets under Contracts."
22	Lanny Arvan and Jan K. Brueckner, "Risk Sharing in the Adjustable-Rate Loan Market: Are Existing Contracts Efficient?"
23	Dixie M. Blackley and James R. Follain, "Tests of Locational Equilibrium in the Standard Urban Model."
24	James R. Follain, "Another Look at Tenure Choice, Inflation, and Taxes."
25	Cheng F. Lee and Morgan J. Lynge, "Financial Ratio Comparison of Savings and Loan Associations and Commercial Banks."
26	James R. Follain and Jan K. Brueckner, "Federal Income Taxation and Real Estate: A Survey of Tax Distortions and Their Impacts."
27	J. Fred Giertz and A. James Heins. "The Income Tax and Housing Tenure: A Closer Look at Owning Versus Renting."

DAVID LEE

Illinois Hospitals

Generally, Illinois hospitals conform to national norms based on such measures as size, concentration, and use of capacity. At the same time, evidence points to the fact that Illinois hospitals are operated at greater cost and receive higher gross revenue than do the majority of other US hospitals. In fact, this difference between revenue and cost per patient per day exceeds the national average by 72 percent. However, increased competition in the health care industry resulting from new developments such as HMOs will probably bring these costs in line with those in the rest of the country.

The hospital industry in Illinois represents a dynamic and diverse component of the state economy. Consisting of more than 279 private and public institutions, this industry earned more than $24.5 billion in gross revenue in 1983 while treating more than 1.8 million patients. Moreover, these hospitals vary greatly in size, concentration, services offered, and the means of ownership, making hospitals unique among industry groups. This article presents both an overview of the Illinois hospital industry and a comparison of hospitals in the state with those across the nation.

Of the 279 hospitals providing general and other specific care, only nine are operated by the federal government. Of the 270 nonfederal hospitals, 19 offer only psychiatric care, and 6 provide long-term care, with the remainder falling into the classification of a community hospital. This category includes any nonfederal, short-term general hospital, excluding hospital units of institutions whose services and facilities are available to the general public. These 241 hospitals maintained 57,252 beds, had an average daily population of 40,322 patients, and treated more than 1.8 million patients in 1983.

However, community hospitals are a diverse group, varying in a number of important ways. As Table 1 indicates, the median size for a community hospital is between 100 and 200 hundred beds in capacity. Yet hospitals this size treated only 17.9 percent of the total admissions. Far more important to hospital care are the larger hospitals that, although fewer in number, represent the bulk of bed capacity and patient care. For example, the 45 Illinois hospitals with a bed capacity in excess of 400 represent only 18.6 percent of the total number of hospitals, but they account for 45.4 percent of total bed capacity and 45.5 percent of total admissions.

Hospitals also vary in the way they are owned and operated. Of the 241 community hospitals, 189 are owned by nongovernment, nonprofit organizations—usually secular or religious groups. State and local governments maintain 43 hospitals across the state, while 9 hospitals are privately owned and operated for profit. The emergence of the private for-profit hospital has been one of many changes in the hospital industry in the state and nationally. While the total number of community hospitals declined from 285 in 1979 to 241

Table 1. Community Hospitals (1983)

Category	*Hospitals*	*Beds*	*Admissions*	*Occupancy*	*Average Daily Census*
6-24 Beds	4	77	1,608	44.2%	34
25-49	13	509	15,956	48.3	246
50-99	49	3,502	105,771	59.4	2,080
100-199	69	10,394	335,957	63.3	6,575
200-299	46	11,437	379,789	69.7	7,976
300-399	15	5,355	181,067	69.3	3,710
400-499	24	10,565	361,215	75.2	7,942
500 or more	21	15,413	490,267	72.4	11,769
Total	241	57,252	1,871,630	70.4	40,332

Source: *Hospital Statistics*, American Hospital Association, 1984.

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Table 2. Community Hospitals by SMSA (1983)

SMSA	*Hospitals*	*Beds*	*Admissions*	*Population*	*Concent. Ratio*
Nonmetropolitan	88	9,518	292,016	2,073,800	0.0424
Metropolitan	153	47,734	1,579,614	9,378,000	0.0163
Alton-Granite City	8	1,542	49,100	265,400	0.0301
Aurora-Elgin	6	1,516	55,482	318,000	0.0189
Bloomington-Normal	3	607	22,032	120,600	0.0249
Champaign-Urbana-Rantoul	4	815	31,694	172,000	0.0233
Chicago	89	31,567	1,010,019	6,088,300	0.0146
Davenport-Rock Island-Moline	6	1,085	36,717	383,800	0.0156
Decatur	2	800	29,282	129,900	0.0154
East St. Louis-Belleville	6	1,634	57,094	300,300	0.0200
Joliet	3	943	35,603	357,300	0.0084
Kankakee	3	592	19,553	102,000	0.0294
Lake County	7	1,773	63,246	451,600	0.0155
Peoria	6	1,846	62,223	363,500	0.0165
Rockford	5	1,204	44,436	279,200	0.0179
Springfield	5	1,810	63,133	187,700	0.0266

Source: *Hospital Statistics*, American Hospital Association, 1984.

in 1983, the number of for-profit hospitals remained stable, demonstrating the relative strength of this form of ownership.

The level of concentration among hospitals, measured as the ratio of hospitals to population, is surprisingly consistent across the state. Table 2 shows the number of hospitals, number of beds, number of admissions, and the number of hospitals per capita for the 14 SMSAs located in Illinois. Chicago has a relatively low concentration ratio even though the number of hospitals in that area is the greatest. Moreover, concentration ratios are about the same across all SMSAs, averaging 0.020 per 1,000 population. This shows a relatively even dispersal of hospitals. The highest levels of concentration are found in nonmetropolitan areas, where the ratio of hospitals to population is 0.0424 per 1,000. These hospitals are generally small and primarily provide a level of service that is not highly specialized. If extensive or specialized care is indicated, patients can be transported to metropolitan areas where appropriate equipment and personnel are available.

One final area of diversity in hospitals concerns the degree of specialized care offered. While almost all Illinois hospitals maintain a pharmacy and offer emergency service, only a few offer more specific and expensive care. Only 24 percent perform radiation therapy; 23 percent provide a premature birth nursery; 17 percent perform abortions; 12 percent offer open heart surgery; and only 5 percent of all hospitals provide for organ transplants. Such results are typical for the nation as a whole. Specialized and expensive care can be provided in the most cost effective way if offered by only a few hospitals. Patients requiring this type of care can be transferred under what are normally nonemergency conditions.

In many ways, Illinois hospitals compare favorably with those in the rest of the country. To illustrate, the average length of stay in a hospital varies from a high of 9.6 days in New York to a low of 5.4 days in Utah. In Illinois, the average length of stay is 7.9 days, just above the national average of 7.6 days. In addition, Illinois hospitals operate with a capacity utilization of 70.4 percent. Nationally, the typical capacity level is 73.5 percent, slightly above the Illinois mark.

Unfortunately, there are a few areas where the departure of Illinois hospitals from the national average is less positive. First, hospitals in Illinois earn gross revenue per day of in-patient care in the amount of $527.00. This figure places Illinois seventh highest among the states and is $66.07, or 14 percent, above the national average. Second, hospitals in the state operate at greater expense than those in most other states with a total cost per in-patient day of $467.37, compared to the national average of only $426.20. Thus, Illinois hospitals realize a difference between revenue and cost a per in-patient day of $59.63 as compared to $34.73 for the country as a whole. ▲

DAVID MANDY

Small Business: Panacea or Pipedream?

Recently, the contribution of small businesses to the overall health of an economy has been the focus of much discussion. One finding of investigations is that small businesses are responsible for creating a large proportion of new jobs. This is often interpreted as evidence that state and local governments should provide additional support for small business.

This article issues a word of caution about the assumption that the economic well-being of the state would be served by subsidies in which size is an important consideration. In order for incentives to be directed toward the most effective targets, policymakers must understand the role of all types of business. Government should focus attention on those businesses that yield the greatest return in the form of increased employment and income per tax dollar of subsidy. Moreover, it is critically important to measure this return in terms of employment and income that *would not have existed* without government assistance.

The *MIT Program on Neighborhood and Regional Change* has produced large amounts of data on small businesses. David Birch presents the MIT analysis in several articles that provide one foundation for the present inquiry. Other published sources include "Small Business: Jobs, Ideas and Products" in the March 1985 issue of *Illinois Issues*, "Tracking Job Growth in Private Industry" in the September 1982 issue of the *Monthly Labor Review*, and the annual *Inc.* magazine study on state business climates.

One widely publicized finding of that research relates to the dominant role small business seems to play in the process of new job creation. David Birch notes that 67 percent of the new jobs created in their sample were created by firms with 20 or fewer employees. Firms with 100 or fewer employees account for 80 percent of new job creation. The magnitude of these figures has become generally accepted, as other research has drawn similar conclusions.

Primary and Secondary Firms

It may be helpful to draw distinctions between types of firms, primary and secondary. Primary firms constitute the economic base of a state or region. The demand for their products may arise from a geographic area different from the actual physical location of the firm. Hence, such firms can locate in many different areas nationally and, perhaps, internationally. It can be argued that their presence creates the need for other firms. Secondary firms are more local in nature and do not engage in a large amount of trade outside of their geographic location. They serve the existing population and industry.

It is important to understand the difficulty of categorizing businesses in this way. A fine restaurant, for example, superficially appears to be a secondary firm. However, if the restaurant is outstanding in the quality of its service, the physical location of it may be relatively unimportant. The restaurant may succeed in attracting clientele from a large surrounding area solely on the quality of its product. Alternatively, a restaurant may fail as a business due to a poor location. Thus, the categorization of primary and secondary is useful for expository purposes but ignores some important facts. The primary firm has a wide range of location options, however, whereas the secondary firm arises to fill a need in a particular geographic area.

Supporting the Economic Base

Programs that reduce the cost of conducting business may serve to expand employment or income in a state or area. These programs can be tailored to specific types and sizes of firms. It is our view that firms of a primary nature hold the greatest promise. Such firms conduct interstate business, thereby drawing income and wealth into the state. The secondary firms, which serve the needs of the area, will arise in an area without further incentive. Their only prerequisite is that adequate local demand be present to support them. We do not mean to imply that any individual firm must locate in a particular area—only that if the demand for a local service is sufficient, some firm will arise to fulfill the need. Hence, support of primary firms yields multiplied returns as the income imported into the area is spent locally and the area grows by building on the

▷

Table. Illinois Employment and Establishments by Industry: 1983.

Industry	*Employees*	*Establishments*	*Average Firm Size*
Agricultural Services, Forestry, Fisheries	17,500*	2,201	8.0*
Mining	37,500*	1,053	35.6*
Construction	143,581	17,366	8.3
Manufacturing	998,090	18,063	55.3
Transportation and Public Utilities	222,382	8,799	25.3
Wholesale Trade	301,980	22,377	13.5
Retail Trade	759,822	62,564	12.1
Finance, Insurance, and Real Estate	329,242	23,400	14.1
Services	991,123	71,828	13.8

*Estimate

Source: US Bureau of the Census, *County Business Patterns, 1983*, ILLINOIS, US Government Printing Office, 1985.

base provided by the primary firms. If primary firms are present, it is not necessary to provide further support to firms that conduct the bulk of their business in the surrounding community.

We believe that the focus on small business obscures this fundamental principle. Policies may tend to be targeted toward all small businesses instead of being targeted toward primary firms. Undoubtedly many small firms will fall under our category of primary and thus should be encouraged. Many large businesses belong to the category as well, however. The fact that 80 percent of job creation takes place in small firms is irrelevant to the real issue. All that is needed is sufficient demand in the economy within which the particular firm operates (whether it be international, national, regional, or local). Similarly, if the necessary economic base is not present these firms will not survive unless they are continually supported by outside sources. Economic growth would be most meaningfully fostered if government reduced the cost of conducting business for the firms that face an economy consisting of other geographic areas.

Compounding the confusion over small business is the fact that many small businesses are actually secondary firms. The services industries, in particular, are composed mostly of small firms that serve local needs and that rely on the income generated by a large employer in the area for support. The local grocery stores, restaurants, barbers, doctors, lawyers, accountants, and so on will all arise in response to demand in a quantity sufficient to suit the needs and wealth of the community. There is no reason to expend state resources to encourage this type of business. Retail and some wholesale trade also fall into this category, yet in the MIT sample 72 percent of the new jobs were generated in these industries—industries that, as a general rule, serve the existing population and, therefore, should not receive support from state and local governments.

The Table presents the average size of Illinois firms in 1983 by major industry. From this, it is clear that mining, manufacturing, and transportation consist of relatively large firms while construction, trade, finance, and services consist of relatively small firms.

This grouping is roughly equivalent to the grouping arrived at if industries were classified as primary and secondary. Manufacturing and mining are generally primary industries, while transportation may be either, depending on the particular firm. Similarly, services, retail trade, and construction are secondary industries, while wholesale trade and finance may be either. The significant exception to this trend is agriculture, which is responsible for large exports from the state but which is also composed of relatively small firms.

This breakdown suggests that it is the manufacturing firms that should be supported by state and local governments since these are the primary firms. In general, these are not small businesses. Data from the Illinois Department of Commerce and Community Affairs (DCCA) supports this view. DCCA found that the value of Illinois manufacturing exports was $10,369 million in 1981. This represents 26 percent of manufacturing output for the year. The relative contribution of other industries (excluding agriculture) to Illinois exports is so small that records are not kept.

The state should carefully examine how it decides which firms to target for business assistance. If the net payoff is positive, the state should support the production of those goods and services that can be produced elsewhere in lieu of production here regardless of the size of the firm. This will include some small businesses, particularly in the high-tech and wholesale trade industries and will include some large firms in manufacturing, mining, and transportation industries. ▲

DWIGHT R. MCCURDY AND JOHN H. BURDE

Firewood Consumption Survey

During the 1982–1983 heating season, nearly one-fourth of the households in Illinois burned more than 1.7 million cords of wood. (A cord is a stack of wood 4 feet high, 8 feet wide, 4 feet long). To describe these firewood consumption patterns, predict future rates, and analyze the impact on Illinois forests, a telephone survey was conducted of 7,506 households. The survey was completed by the Forestry Department, Southern Illinois University during the spring of 1983.

Illinois Consumption

In 1980 the Bureau of Census estimated there were approximately four million households in Illinois. As mentioned, nearly one-fourth of the 7,056 persons interviewed said their household burned firewood during the 1982–1983 heating season. Therefore, it is estimated that more than 900 thousands households burned firewood.

When spokesmen for the households in which wood was burned were asked the amount, on the average, they estimated 1.9 cords annually. (See Table 1.) Therefore, the estimated total consumption of firewood in Illinois was approximately 1.7 million cords of wood.

Table 1. Annual Firewood Consumption Per Household

Consumption (Cords)	*Percent of Households*
Less than 1.0	42
1.0 to 2.0	34
2.1 to 5.0	16
5.1 to 10.0	7
10.1 or more	1

Consumption Patterns

The two reasons given for burning wood were for heating and aesthetics, 53 percent and 47 percent of the households, respectively. However, less than one-fourth of the spokemen said they used firewood for more than one-half of their total heat (Table 2). Most of the households burning firewood had a fireplace; slightly less than one-fourth had a wood stove. Natural gas was the major source of energy replaced by firewood, followed by electricity and propane. One-half of the households had begun burning wood in the past five years.

More than three-fourths of the families burning wood said they cut some or all their wood supply. Thirty percent of the people that burned wood said they purchased some or all of their firewood. The average price paid per cord during the 1982–1983 heating season was $83.

Table 2. Percent of Heat Provided By Wood

Percent of Heat	*Percent of Households*
Less than 10	33
10 to 25	31
26 to 50	12
51 to 75	6
76 to 99	9
100	9

Socio-Economic Characteristics of Households

On average there were three people per household surveyed. Households that burn wood average 3.6 people whereas households not burning wood average 2.7 people (see Table 3). The average age of the head of household was 49 years, while those who burned wood averaged 45 years and those not burning wood, 51 years.

Table 3. Socio-Economic Characteristics of Illinois Households

Characteristics	*Percent of Households*		
	All	*Burn Wood*	*Don't Burn Wood*
Size:			
One Person	15	5	19
Two Persons	70	73	69
Five or More Persons	15	22	12
Age of Household Head:			
Less than 30 years	15	12	16
30 to 50 years	40	57	34
51 to 65 years	26	23	27
More than 65 years	19	8	23
Occupation of Household Head:			
Professional-Technical	29	35	21
Craftsmen-Foreman	12	12	12
Operatives	10	13	10
Clerical-Sales	10	10	8
Household-Service	6	7	7
Farmer	4	7	5
Unemployed-Housewife	3	4	5
Student	1	–	2
Retired	25	12	30
Household Income:			
Less than $15,000	31	17	41
$15,000 to 24,000	28	28	30
$26,000 to 50,000	33	44	25
More than $50,000	8	11	4
Type of Residence:			
House	81	96	78
Apartment	12	1	14
Mobile Home	3	3	5
Other	3	–	3

▷

Source of Firewood

Of the firewood users interviewed, 77 percent indicated they cut some of the wood they burned. Nearly 2 million cords of firewood were cut or gathered in Illinois. The amount of wood cut ranged from 1/10th cord to 100 cords, with the average being 2.9 cords cut per individual annually (See Table 4).

Nearly all of the firewood cut was obtained from private land, either the householders own or other private lands. Very little wood was obtained from public land. The firewood obtained from private lands derived equally from the householder's own land and other private land such as a friend's property.

Table 4. Quantity of Firewood Cut

Quantity (Cords)	*Percent of Households Cutting Wood*
0.1 to 0.9	31
1.0 to 2.0	32
2.1 to 5.0	23
5.1 to 10.0	11
10.1 to 100.0	3

Statistical Interrelationship of Data

Using stepwise regression analysis, the following variables were found to be correlated with the amount of wood burned by households:

1. Amount of wood cut—the more wood cut the more wood burned;
2. The percent of household heat supplied by wood—the greater percent of heat supplied the more wood burned;
3. Sex of head of household—males burn more wood than females;
4. Ownership of land with an available wood supply—landowners burn more wood than nonlandowners;
5. The type of fuel replaced by wood— households using natural gas generally burn less wood than the average household;
6. The type of burning unit used—households with stoves burn the most wood;
7. Age of head of household—younger people burn the most firewood;
8. The percent of wood supply purchased—the less wood purchased the larger amount of wood burned;
9. Household income—the greater the annual income the more wood burned;
10. Number of people in the household—the larger the number of people in the household the more wood burned; and
11. Occupation of head of household—farmers and operatives burn the most and students and retirees the least amount of firewood.

The above variables were listed in order of the strength of the correlation, that is the amount of wood cut having the strongest correlation with the amount of wood burned. These factors account for approximately one-half of the variation in the amount of wood burned between various households.

The following relationships were found to be statistically significant at the 99 percent probability level using analysis of variance and Chi Square test:

1. Households that burn the most wood are also the most apt to cut wood for their own use and, as a result, are less likely to purchase firewood;
2. Households that depend heavily on firewood for heat also burn and cut more wood than the average household that burns firewood;
3. Households that cut or gather the most firewood also burn the most wood, rely the heaviest on wood for heat, and are the most apt to have a wood stove rather than a fireplace;
4. Households with wood stoves burn the most wood, cut the most wood, rely on wood for a greater percentage of their heat, and purchase less wood;
5. Households with the lowest annual incomes are most apt to rely on firewood for a large proportion of their heat than other households;
6. Farmers, on the average, cut the most firewood; and
7. Households using natural gas for heating rely the least on firewood for heat—a large proportion of these households are in the Chicago area. ▲

Dwight McCurdy is a professor and John Burde an associate professor in the Department of Forestry, Southern Illinois University at Carbondale.

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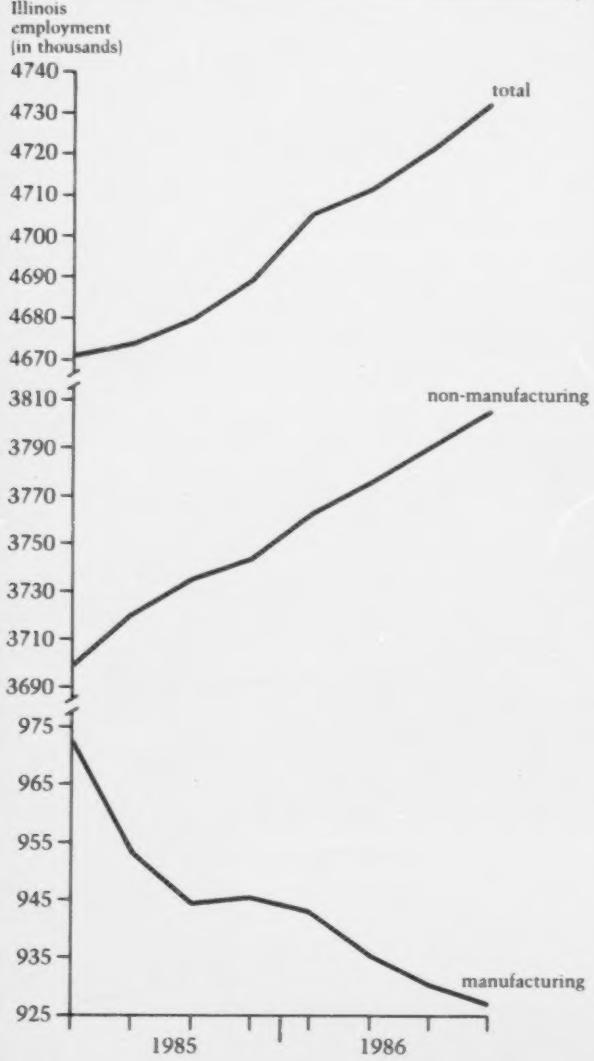
Illinois Employment Forecasts (in thousands)

	85:IV			HISTORY				FORECAST			
	Forecast	*Actual*	*Error*	*85:I*	*85:II*	*85:III*	*85:IV*	*86:I*	*86:II*	*86:III*	*86:IV*
Mining	25.5	25.4	0.1	24.1	25.4	25.7	25.4	25.0	24.7	23.4	24.0
Construction	166.3	167.6	–1.3	149.9	163.8	166.8	167.6	167.0	166.3	166.5	166.5
Manufacturing	941.3	945.5	–4.2	972.5	953.3	944.4	945.5	943.0	935.7	932.6	927.2
Nondurable manufacturing	363.6	367.8	–4.2	367.2	365.9	366.4	367.8	366.6	365.2	363.7	362.9
Food products	94.8	96.0	–1.2	95.5	95.0	95.4	96.0	95.9	95.3	94.8	94.4
Printing and publishing	102.7	103.7	–1.0	101.9	102.7	103.3	103.7	103.2	103.0	102.5	102.1
Chemical products	60.3	60.3	0.0	61.5	60.4	60.8	60.3	60.5	60.4	60.6	60.8
Miscellaneous nondurables	105.9	107.4	–1.5	108.1	107.3	106.7	107.4	107.1	106.4	105.7	105.6
Durable manufacturing	577.7	577.7	0.0	604.8	587.5	578.0	577.7	576.3	570.5	567.0	564.2
Primary metals	54.7	56.1	–1.4	59.0	56.9	55.2	56.1	56.3	55.8	55.7	55.9
Fabricated metals	109.3	110.4	–1.1	111.5	110.7	110.7	110.4	109.6	108.3	107.1	106.2
Nonelectrical machinery	144.6	145.7	–1.1	154.9	147.6	142.8	145.7	143.5	140.9	139.2	138.2
Electrical equipment	124.6	122.4	1.8	132.1	128.5	125.8	122.4	121.7	120.0	119.2	118.5
Miscellaneous durables	144.5	143.3	2.2	146.8	144.2	143.5	143.3	145.2	145.4	145.7	145.4
Transportation and utilities	274.3	276.4	–2.1	273.7	274.4	277.1	276.4	273.9	271.5	269.6	268.1
Wholesale and retail trade	1165.3	1170.1	–4.8	1158.2	1161.5	1166.4	1170.1	1176.6	1180.5	1184.1	1187.6
Finance	328.6	325.5	3.1	321.5	322.8	324.5	325.5	329.1	333.3	337.6	341.8
Services	1090.8	1079.6	11.2	1058.2	1070.8	1083.7	1079.6	1088.6	1097.2	1106.0	1114.8



Illinois Economic Outlook

Employment in Illinois has grown since 1984 according to figures released by the Bureau of Labor Statistics, and projections from the Illinois Econometric Model indicate that this growth will continue. However, manufacturing has not shared this growth. Manufacturing lost nearly 30,000 jobs in 1985 and is projected to lose 15,000 more in 1986. A large part of this decline has been in durable goods.

As can be seen in the accompanying graph, an increase in nonmanufacturing employment has more than offset the loss. Each nonmanufacturing sector grew substantially in 1985, and the growth is projected to continue throughout 1986.

This month we are also providing comparisons of the actual estimate for the fourth quarter of 1985 with the forecasted values. Each category exhibited an error of one percent or less, with the forecast for durable-goods manufacturing being exactly correct. The model failed to predict, however, the sudden decline in service employment.

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ILLINOIS BUSINESS INDEXES

	Percent Change Jan 1985-Jan 1986	*Jan 1986*	*Dec 1985*	*Nov 1985*	*Oct 1985*	*Jan 1985*	*Dec 1984*
Coincident Indicator (1969 = 100)	4.11%	120.95	120.81	119.54	120.35	116.17	112.78
Employment-manufacturing (in thousands)[e]	–0.36%	962.8	971.1	944.6	948.3	966.3	971.0
Average weekly hours-manufacturing[e]	0.74%	40.7	41.9	41.3	40.8	40.4	39.1
Weekly earnings-manufacturing[e]	3.29%	$428.57	$442.88	$435.30	$429.62	$414.91	$402.73
Help wanted advertising-Chicago (1969 = 100)[a]	1.11%	91	104	103	96	90	107
Help wanted advertising-St. Louis (1969 = 100)[a]	35.29%	69	67	65	64	51	61
Retail Sales (in millions)[b]	4.28%	$4,553	$6,296	$5,455	$5,359	$4,366	$5,994
Coal production (in thousands)	3.43%	$5,813	4,632	4,198	5,714	5,620	4,748
Petroleum products (in thousands)[e]	–2.95%	$2,465	2,533	2,565	2,719	2,540	2,559
Vendor performance	–2.13%	46.0%	46.0%	42.0%	46.0%	47.0%	45.0%
Building permits (in thousands)							
Residential housing units	8.72%	0.997	0.950	2.751	3.316	0.917	1.086
Value of Residential housing	101.05%	$114,224	$165,595	$157,000	$211,277	$56,813	$71,393
Value of nonresidential construction							
Industrial buildings	–16.15%	$18,901	$13,340	$30,241	$34,849	$22,541	$10,800
Office, banks, and professional buildings	123.14%	$56,652	$61,950	$26,582	$74,525	$25,389	$91,400
Stores and other mercantile buildings	1.56%	$10,822	$21,667	$15,694	$35,041	$10,656	$9,834
Other	32.87%	$1,718	$4,534	$3,534	$4,502	$1,293	$1,219
Consumer price index (December 1977 = 100)							
North Central US[c]	3.29%	—	176.0	—	174.9	—	170.4
North Central/population more than 1,250,000[c]	3.58%	—	179.4	—	178.2	—	173.2
North Central/population 385,000 to 1,250,000[c]	2.96%	—	174.2	—	173.4	—	169.2
North Central/population 75,000 to 385,000[c]	3.06%	—	171.5	—	170.1	—	166.4
North Central/population less than 75,000[c]	2.98%	—	172.6	—	171.6	—	167.6
Chicago (1967 = 100)	3.55%	326.3	325.9	324.2	322.6	315.1	314.0
St. Louis (1967 = 100)	2.90%	322.4	—	321.6	—	313.3	—
		1985:III	1985:II	1985:I	1984:IV	1984:III	1984:II
Personal income (in millions)[d,e]	3.09%	$165,131	$166,908	$164,894	$162,200	$160,180	$156,710
Per capita personal income[d,e]	2.00%	$14,148	$14,311	$14,148	$14,024	$13,871	$13,593

[a] The Conference Board, *Help Wanted Advertising*, Jan. 1986. [b] Latest month projected by BEBR. [c] Percent change between December 1984 and December 1985. [d] Percent change between 1984:III and 1985:III. [e] Recent month is preliminary figure.

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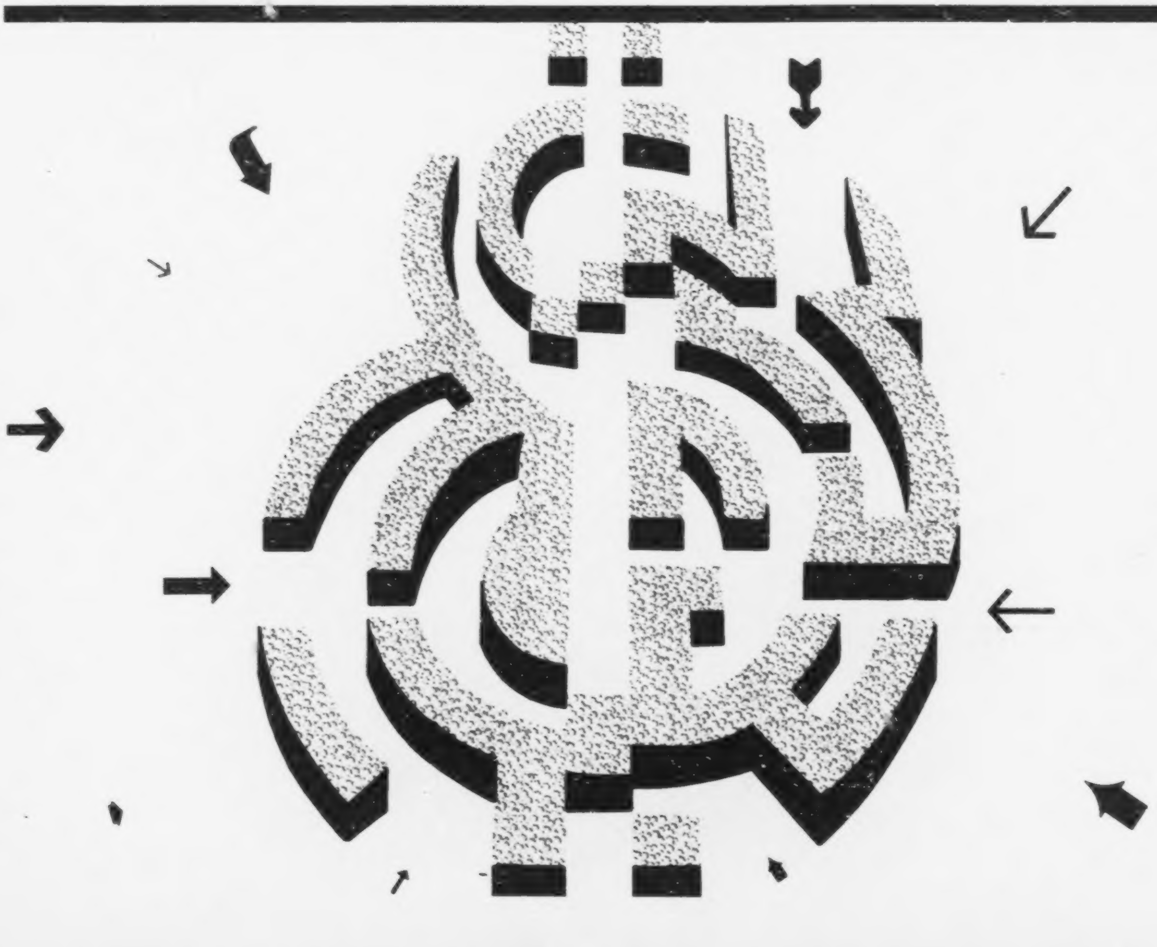

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DAVID MANDY AND DEBORAH MUSTELL

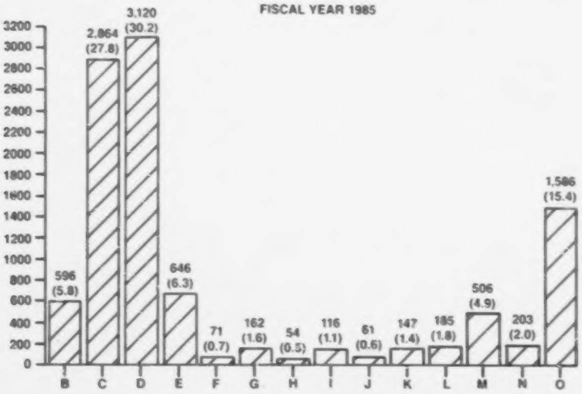
Cash Flows in the Illinois State Budget

Discussion of the fiscal position of the state government intensifies during election years as candidates articulate alternative plans for the state. The state's general fund is usually at the center of this discussion, since the general fund finances most state government operations. This article presents a flow of funds examination of the Illinois general fund since fiscal year 1971 (FY71).

General Fund Flows in FY85

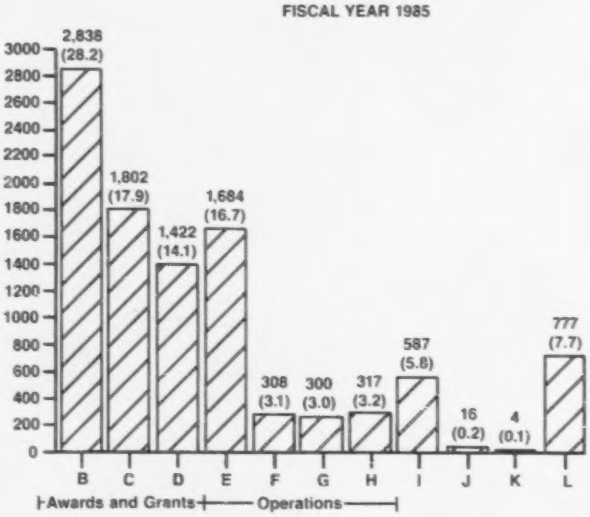
The first step in charting the state's fiscal progress is to identify the sources and uses of funds in the state's general fund. Chart 1 shows the major sources of revenue for FY85. Total revenues for each category are given while numbers in parentheses represent the percent of total revenues for each category. The largest revenue categories are the sales and personal income taxes, with $3,120 million (30.2 percent) and $2,864 million (27.8 percent), respectively, in FY85. Similarly, Chart 2 depicts the chief spending categories for FY85. The largest expenditure items are public aid, common school funds, and personal services with $2,838 million (28.2 percent), $1,802 million (17.9 percent), and $1,684 million (16.7 percent), respectively, in FY85.

Chart 1. General Fund Revenues (Millions of Dollars)



B = Corporate income
C = Personal income
D = Sales
E = Public utilities
F = Liquor gallonage
G = Cigarettes
H = Corporation franchise and fees
I = Insurance and fees
J = Inheritance
K = Investment income
L = Other state sources
M = Lottery transfer
N = Other state transfers
O = Federal sources

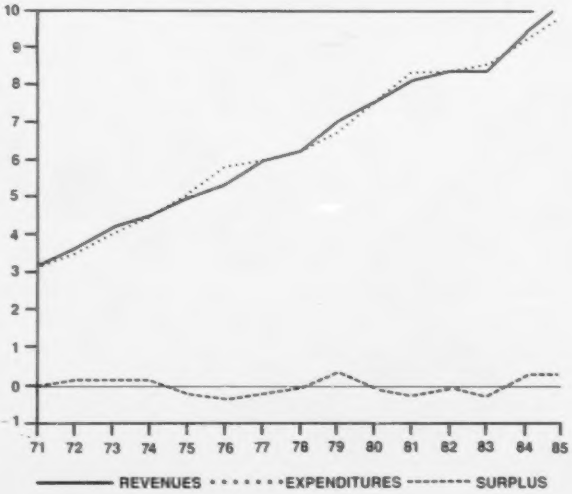
Chart 2. General Fund Expenditures (Millions of Dollars)



B = Public Aid
C = Common school fund
D = Other grant
E = Personal services
F = Contributory benefits
G = Contractual services
H = Other operations
I = Refunds
J = Debt service
K = Permanent improvements
L = Transfers out

Total annual revenues and expenditures for FY 71–85 are shown in Chart 3. Since the state cannot legally operate at a deficit, the amount of any deficit is restricted to the cash on hand and the limits to the state's short-term borrowing ability. The figures discussed in this article exclude any short-term borrowing or principal payments on short-term debt. ▷

Chart 3. General Fund (Billions of Dollars)



The difference between revenues and expenditures is graphed at the bottom of Chart 3. This difference is one measure of whether the state is operating a current surplus or deficit. By this measure, major surplus years occurred in FY79, FY84, and FY85, while the state experienced major deficits in FY81 and FY83.

Balanced Budget Defined

One must be cautious in discussing surpluses and deficits for the state government because there are several different definitions of the phrase "balanced budget." State Comptroller Roland W. Burris discusses these alternative definitions in the June 1985 issue of the state's *Monthly Fiscal Report*. Comptroller Burris refers to the difference between revenues and expenditures as the "available balance concept." He argues that this method is flawed because it requires the state to end the fiscal year with the same balance on hand as existed at the beginning of the fiscal year in order for the budget to be balanced, even if the beginning balance were at record high levels, as was the case at the beginning of FY86. The state is required to maintain this record-setting level of cash in order for the budget to be termed "balanced."

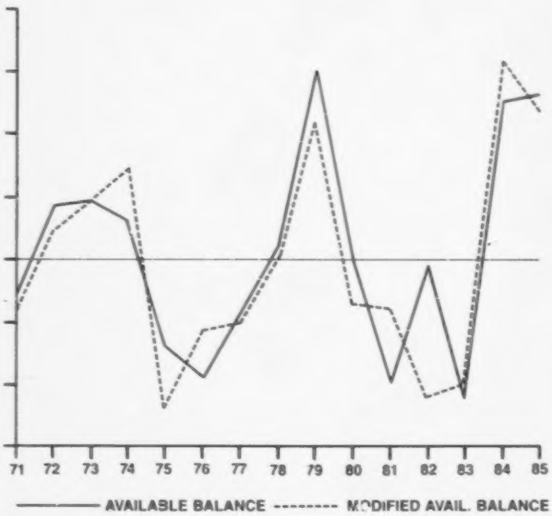
Comptroller Burris notes that this defect is particularly disturbing because obligations are still outstanding against any fiscal year's budget after the fiscal year ends. These obligations are called lapse-period warrants and are paid out in the lapse period, the three months following a fiscal year. Hence, the available balance measure overstates the budget position.

An alternative definition of a balanced budget, the "budgetary balance concept," that accounts for lapse-period warrants is discussed by Comptroller Burris. It defines the budget as balanced if the end-of-year balance is greater than the lapse-period warrants for that year.

The problem with this definition is that it ignores changes in end-of-year balances that may occur after lapse-period warrants are accounted for. For example, if the general funds balance were $100 million on 30 June 1984 and lapse-period warrants for July, August, and September of 1984 amounted to $40 million, then the budgetary balance after all FY84 spending is subtracted would show a surplus of $60 million. Now suppose that the general funds balance on 30 June 1985 were $150 million and that the lapse-period warrants for FY85 were $100 million. Then the budgetary balance after all FY85 spending is subtracted would be $50 million. The budget shows a surplus of $50 million for FY85 by the budgetary balance method *even though the budgetary balance after all spending is subtracted out for each year declined by $10 million.*

Whether or not this is viewed as a problem depends on the approach one takes toward the state budget. At the most basic level, the issue is whether one views the stock of funds at a point in time or the flow of funds over time as the most important indicator. The budgetary balance method argues that the balance the state has at its disposal is the important indicator of the state's fiscal health, regardless of whether the state is spending more than it is collecting in taxes in any given year. Alternatively, the available balance method involves comparing revenues with expenditures in any given year. Even so, the approaches are not completely separate. The comparison of flows yields information concerning the trend in the balance the state has at its disposal.

Chart 4. General Fund (Millions of Dollars)



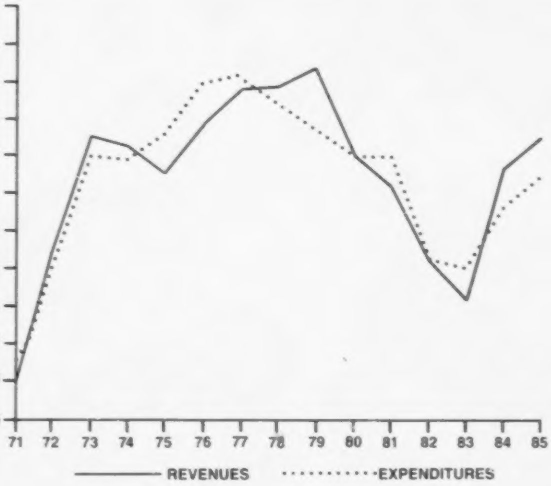
One modification of the available balance method accounts for lapse-period warrants by comparing end-of-year balances after lapse-period warrants. Chart 4 graphs results from the "modified available balance" budget balance definition against results obtained by using the available balance definition. Chart 4 makes it clear that although the definitions differ, the figures follow each other closely. But for a given year, FY82 for example, the two quantities may differ significantly. According to this definition, the budget has been in surplus for the past two fiscal years. However, the surplus in FY85 decreases by the "modified available balance" method, while the FY85 surplus increases slightly by the available balance method. This reflects large lapse-period warrants for FY85 which offset the large year-end balance.

The outlook for FY86 is less optimistic. At this writing, the Bureau of the Budget is projecting a year-end balance of $220 million. The budgetary balance method therefore implies that if lapse-period warrants exceed $220 million the state will have incurred a deficit this year. Based on experience since FY78, it is unlikely that lapse-period warrants will be this low. By the available balance method, the $220 million prediction is also pessimistic, since it falls $259 million short of last year's $479 million year-end balance. Similarly, the modified available balance method predicts that lapse-period spending must fall below $176 million in order for the budget to be balanced. ▷

Real Budget Flows

Revenues and expenditures in 1967 dollars are depicted in Chart 5. Here, the surplus year of FY79 is clearly evident. The effects of the recession in the early 1980s are also dramatically illustrated, as real revenues and expenditures plunged over 15 percent. The sharp increase in real revenues in FY84, accompanied by a similar increase in real expenditures, was a result of the temporary increase in income tax rates and the permanent increase in the sales tax rate enacted by the legislature.

Chart 5. General Fund (Billions of Constant Dollars)



On 1 July 1983, the personal income tax withholding rate was increased from 2.5 to 3.5 percent and the corporate income tax rate was increased from 4 to 5.6 percent. Then, on 1 January 1984, the personal income tax rate was changed to 3.0 percent and the corporate income tax rate to 4.8 percent. On 1 July 1984, these rates returned to 2.5 and 4 percent, respectively. Further, the sales and use taxes on food and drugs were reduced in steps from 4 percent to 0 over the period from 1 January 1984, and the tax on other taxable items was increased from 4 to 5 percent on 1 January 1984. Only with these increases did the state return to a surplus. The slower growth in FY85 reflects the expiration of the income tax increases, even though real revenues continued to increase in FY85 due to the gradual recovery of the Illinois economy. ▲

The data used to construct Charts 1-5 were provided by the Comptroller's Office, State of Illinois.

Editor's Note

We are pleased to publish responsible criticism or oposing opinions of views taken, or implied, in the Illinois Business Review.

WILLIAM R. BRYAN

MARIANNE FERBER

An Ancient Solution to a Modern Problem: The Procrustean Approach

In the February issue of the *Illinois Business Review* the question was asked "Is Unemployment a Labor Supply Problem?" In brief, the author argues that "if the labor force had not grown as fast as it did, the unemployment level would now be much lower."

It is of course true that there has been a substantial increase in the size of the labor force, and it is further correct that this is primarily so because of the rapid influx of women into the labor market. But if unemployment were simply caused by the existence of a larger labor force, how would one explain the far higher unemployment rates in the 1930s, when the labor force was far smaller and when, incidentally, the vast majority of women were full-time homemakers?

The problem with this approach is that it applies micro analysis, which assumes that as one variable changes everything else remains the same, to the labor market as a whole, where this is entirely unrealistic. Does anyone really believe that demand for goods and services, and hence the demand for labor, would be the same if labor force participation were equal to that in 1950?

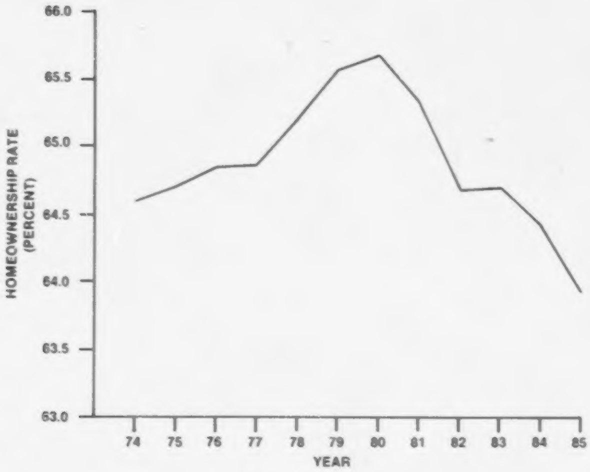
There is also a second question that needs to be raised. Mr. White objects to the view of unemployment as a sign of not enough jobs to go around, and suggests that it may just as readily be seen as a case of too many people wanting jobs. In this instance, he is technically correct. But is there a substantive case to be made that when people need or want to work it is just as acceptable simply to tell them that there is no place for them, no opportunity for them to be self-supporting, productive members of society, as it is to make an effort to improve the functioning of the economy? This is a view that would have appealed to Procrustes, the mythical king who stretched short visitors, and cut off the limbs of tall ones, in order to have them fit the size of his bed.

Marianne Ferber is a professor of Economics and former director of the Office of Women's Studies, University of Illinois at Urbana-Champaign.

DOUGLAS B. DIAMOND, JR.

Real Estate Developments: Recent Trends in Homeownership

Chart 1. Homeownership Rates for All Households 1974–1985



Sources: 1974–1980 Annual Housing Survey,
1981–1985 Annual Averages from the Housing Vacancy Survey

It currently appears that, for the first time in five decades, the homeownership rate at the end of this decade will be lower than at the beginning. As of 1985, the overall national rate was 63.9 percent, compared with the rate of 65.6 percent in 1980 (see Chart 1). The current rate is a new low for the decade, despite renewed economic growth and interest rates as low as in 1980. Moreover, this decline comes in the face of demographic trends that would have raised the national average over the period in the absence of other shifts. Why has this decline occurred? Is it general or is it focused among certain groups? Will it be reversed by the recent decline in interest rates? These are important questions from a social perspective as well as a matter of concern to real estate professionals. This article reviews the available data on these and related issues. The conclusion here is that the decline in those choosing to own is primarily a response to a major increase in the relative cost of owning versus renting. The decline has been concentrated among younger, married households. In fact, recent ownership rates among these households are very similar to those of the early 1970s, when homeownership was also expensive relative to renting. However, the trend probably will be reversed by the most recent drop in interest rates.

The Cost of Owning versus Renting

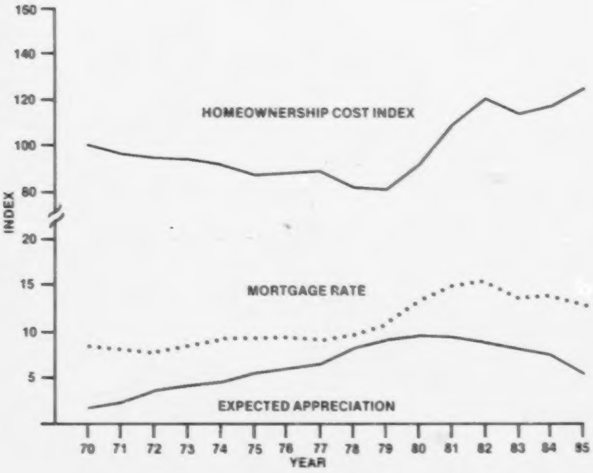
To understand the recent decline in homeownership, one must look back almost 10 years. In the late 1970s, there was a surprising upward trend in homeownership rates at a time of rising nominal interest rates. The explanation seemed to be that housing had become an investment, that is, expected price appreciation was being incorporated into the decision to become a homeowner. The expectation of house price appreciation due to inflation was more than offseting the rise in interest rates due to inflation. In addition, homeowner tax considerations were also being enhanced by inflation. Inflation was pushing people into higher tax brackets. It also made homeownership a better tax shelter. Although expectations of inflation presumably pushed up interest rates, the increase was currently deductible. The related increase in appreciation was essentially tax exempt. Thus, the tax advantages of owner-occupied housing rose with higher levels of expected inflation. (Inflation also operates to make rental housing a better tax shelter at higher inflation rates. However, such an effect takes time to translate into lower rents. Meanwhile, households decide on ownership based on comparing current rents with what they think their net cost of ownership will be.)

Researchers have calculated several time-series on the after-tax, inflation-adjusted cost of homeownership. One such series is shown in Chart 2. As with most of the other series, there is a downward trend from 1970 to 1978–1979 in the true cost of ownership, both because of tax advantages and because nominal interest rates lagged the rise of inflation. (I concluded that the major impact derived from a decline in real, before-tax interest rates and not from the expected impact of inflation on the tax advantages). There followed a major jump in cost between 1979 and 1982, as nominal (and real) interest rates rose rapidly. In particular, the average effective rate on fixed-rate mortgages closed in 1982 was 15.33 percent, up by over 40 percent from the 10.92 percent in 1979.

This upward shift in ownership costs was widely recognized at the time, so the immediate decline in homeownership was no surprise. This decline was accelerated by the particularly high rates of unemployment among the younger households who would have been the first-time home buyers. What is less generally recognized, however, is that the estimated cost of homeownership has remained (until recently) in the same range as it was in 1982, despite the decline of almost 3 percentage points in nominal interest rates. This result reflects four years of remarkably slow appreciation in nominal house prices, an average of 2.8 percent through 1985. Since the formula used here assumes that people forecast future appreciation by looking at recent appreciation, the decline in actual appreciation has set in motion a steady decline in expected appreciation that has matched the drop in the nominal interest rate, leaving a real interest rate in 1985 at about the same level as in 1982 (see Chart 2).

Presumably, homeownership depends on the relative cost of owning and renting, not just the cost of owning. However, the net trend in the ratio of estimated ownership costs to a series on adjusted gross rents (Chart 3) is only slightly different from the trend in ownership costs alone. A steady decline in relative ownership costs after 1970 terminated in 1978 and rapidly reversed itself from 1979 to 1982. Our initial estimates for 1985 are not much different from the 1982 peak. The conclusion stands that ownership in 1985 was probably less attractive than at any time since 1970.

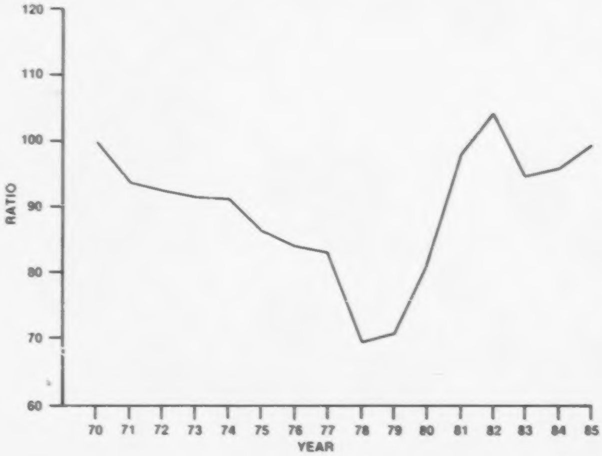
Chart 2. Real After-Tax Cost of Homeownership 1970–1985 (1970 = 100)



Note that in this chart the before-tax real interest rate in 1985 was about the same as in 1970. Net ownership costs are higher than in 1970, primarily because of higher house prices and operating costs.

The continued high relative cost of owning, taken by itself, is enough reason for the generally lagging behavior of overall ownership rates. However, there are many further insights to be gained by breaking out the population into a number of demographic and socioeconomic components. These insights both confirm and embellish the basic story and reveal much about how individuals in different circumstances respond to a major shift in the cost of renting versus owning.

Chart 3. Ratio of Homeownership Costs to Adjusted Gross Rents, 1970–1985 (1970 = 100)



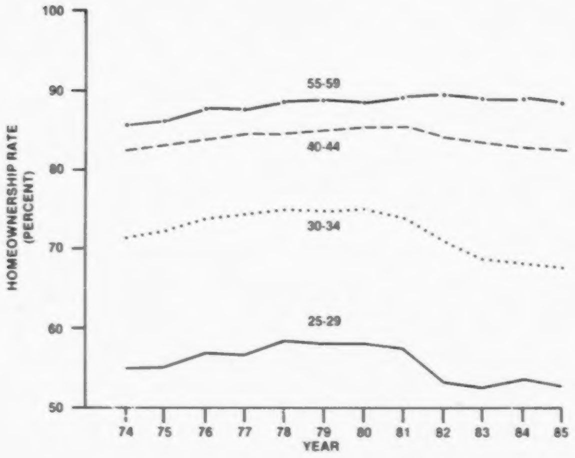
Adjusted Gross Rent is Residential Rent, as defined by the Bureau of Labor Statistics, plus utilities and other tenant paid items plus an adjustment for depreciation, deflated by the GNP personal consumption deflator. For an explanation of the adjustment, see Ira S. Lowry, "Inflation Indexes for Rental Housing," RAND Corporation, Santa Monica, California, 1981.

Homeownership Trends by Age.

The most dramatic difference in the way different socioeconomic and demographic groups have responded to the rise in ownership costs is across age levels. This difference is to be expected for a number of reasons. In particular, young households are more likely to rent and thus have not established any commitment to owning. They are also more likely to move and thus be faced with an immediate choice in the matter of ownership. For example, about 34 percent of all households with heads aged 25–29 moved in 1983, compared with 8 percent of households with heads between 55 and 59.

Data on ownership by age for 1981–1985 from the Housing Vacancy Survey (HVS), matched with data for 1974 to 1980 from the Annual Housing Survey, confirm

Chart 4. Homeownership Rates for Married Couple Households, 1974–1985.



this adjustment pattern. We have smoothed the quarterly data from the HVS by using annual averages. Chart 4 shows the trend in these ownership rates for married couples in selected age groups. We have held constant the marital status because it is a separate major determinant of the ownership decision.

The homeownership rates for married couples with heads aged 25–29 and 30–34 showed steep declines of 4 and 6 percentage points, respectively, between 1979 and 1985. Over the same period, the households with heads age 55–59 showed a small increase in ownership.

Trends by Marital Status.

We have focused on the ownership rate of married couples broken into five-year age groups. This is essential for the period under analysis because there was a major shift in the marital composition of several age groups. Since nonmarried households at each age level have lower rates than married households, the shift towards more nonmarried households would have reduced the age-specific ownership rates even in the absence of a drop in ownership propensity for a given type of household.

Having separated out the nonmarrieds, we find that the age-specific rates for nonmarried households rose or fell very little. Why the divergence in reaction by marrieds and nonmarrieds? In fact, since the nonmarrieds have a higher mobility rate than marrieds, they should respond to a change in tenure price more sharply and swiftly. Moreover, the rate actually increased for some age groups over part or all of the period. This unusual pattern may be due to two other considerations. First, the ownership rates of the nonmarrieds has risen very rapidly in the 1970s, and this rise was carried over into the following age groups as the cohort aged into that group. Secondly, there seemed to be a sociological redefinition of single status at both younger and older ages. At the younger age groups, the one-person female households tended to show the most upward trend, presumably reflecting shifts towards a career orientation and an expectation of a longer, perhaps permanent, duration of the single status. At older age groups, for example, age 50–54, both male and female singles tended to show increases in ownership, perhaps also because of a shift in the perception of the status as permanent.

Future Prospects.

In 1985, the real interest rate and homeowner costs were approximately as high as in 1982, yet ownership had continued in a downward trend. The continued downward trend presumably reflected the lags in households adjusting to the sudden changes. However, in 1986, interest rates have fallen sharply, probably more than have expectations of house price appreciation. At the same time, the upward trend in real rents has continued, despite the high rates of new rental construction in many markets. Thus, homeownership should appear relatively more attractive in 1986.

These shifts should at least stabilize the age-specific, marital-specific ownership rates. In that case, the long-term upward trend in the overall rate should reassert itself, simply because the baby boom generation is aging into the high ownership years. As that aging proceeds, the overall ownership rate will inexorably rise towards 70 percent or higher. However, the peaks in ownership by younger households reached in the late 1970s may not be surpassed any time soon.

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New Publication

Last October the Office of Real Estate Research in cooperation with Lambda Alpha International sponsored a conference on the Impact of Tax Reform Proposals on Real Estate Investment. A volume based upon papers presented at the conference is now available. Tax Reform and Real Estate, *edited by James R. Follain, is published by The Urban Institute Press. Copies can be obtained by writing to: Urban Institute Press, 2100 M Street, NW, Washington, D.C. 20037 or by by calling 202/8578718.*

SARWAR JAHAN, RANDALL W. JACKSON,
AND WILLIAM M. SYVERSEN

Build Illinois: A Regional Impact Analysis

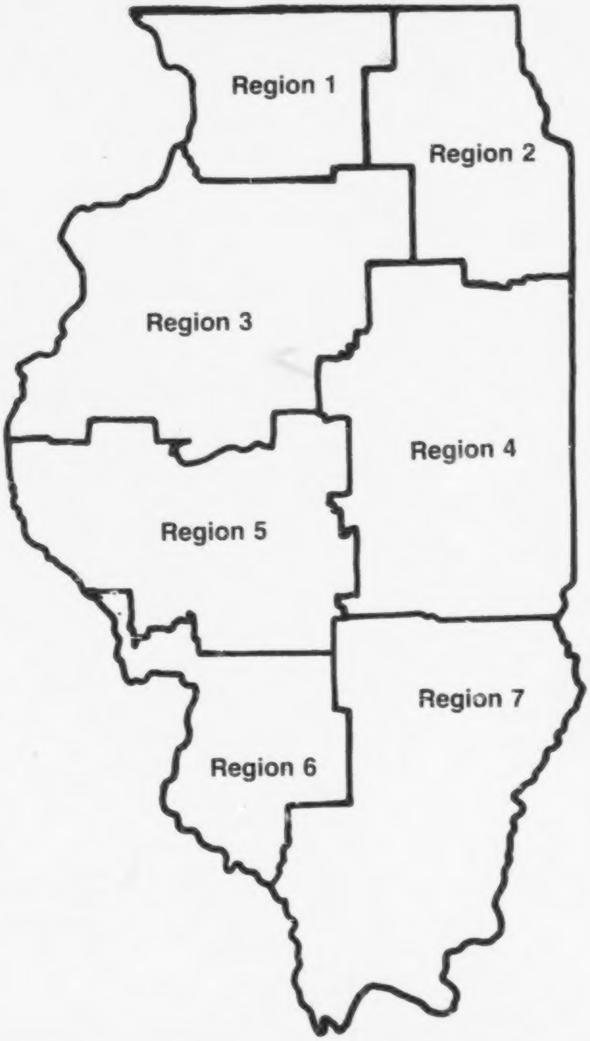
As a master plan for economic development, "Build Illinois" has been launched to meet the needs of an economy that experienced significant growth in high tech and service industries in recent years. Of the five areas of the program considered to be of crucial importance, housing and infrastructure are expected to receive 43 percent and 33 percent of the 2.3 billion dollar total, with the remainder allocated to education, business, and the environment.

The program is expected to affect the economy significantly in terms of growth and job creation. In addition to statewide growth, it is also imperative from a policy perspective to assess the effects of the program on different regions of the state. Differences in the structure of regional economies will cause regions to respond differently to investments in particular sectors. Hence, an investigation into the impact of specific activities on a regional economy would allow planners and policymakers to place regional and sectoral emphasis in proper perspective.

This article presents the results of an input-output study on the probable effects of the "Build Illinois" program on different regions of the state. The study is based on single-region input-output models that do not consider interactions between regions. The models, however, account for leakages out of the regional economic system and, therefore, do not result in overestimation of gross output changes.

Illinois Regions

The Department of Commerce and Community Affairs has divided the state of Illinois into seven subregions on the basis of the commuting patterns



within the state. These regions are shown in the Map. Tables 1–3 show some regional economic indicators for those regions. In terms of population, Region 2 (Chicago region) ranks first with almost seven and half million people, and it accounts for about 64.5 percent of the total population of the state. Region 3 (north central Illinois) is the only other region that has a population of over a million (8.76 percent). All other regions combined account for about 27 percent of the state population.

The Chicago region's employment is slightly less than its share. While 64.5 percent of state total population lives in this region, only 62.9 percent of employed persons live there. At the same time, the Chicago region accounts for about 70 percent of the total manufacturing employment in the state. The manufacturing base of Region 1 (northwestern Illinois) is also quite strong, as is evident from the percentage of manufacturing employment. Although this region ranks seventh in terms of population and sixth in terms of total employment, it ranks third in terms of manufacturing employment. Regions 2 (north central Illinois), 4 (east central Illinois), and 5 (west central Illinois) are characterized by a proportionately larger number of employed persons, while Regions 6 (southwestern Illinois) and 7 (southeastern Illinois) have less total and manufacturing employment than their share by population of the state.

In terms of per capita income as well, Chicago is the leading region in the state, with about 104 percent of the per capita income for the state. In all other regions, per capita income is well below the state average and varies between 71.5 and 87 percent of the state average with the exception of Region 7, which has the lowest per capita income in the state ($4,696).

Table 1. Employment by Regions (1985)

Region	*Manufacturing Employment*	*Percent of State Total*	*Rank*	*Total Employment*	*Percent of State Total*	*Rank*
1	70,410	6.80	3	230,467	5.03	6
2	719,505	69.52	1	2,876,605	62.86	1
3	95,213	9.12	2	426,099	9.31	2
4	58,247	5.63	4	352,965	7.71	3
5	24,164	2.33	7	238,949	5.22	4
6	37,974	3.67	5	234,552	5.12	5
7	29,420	2.84	6	216,676	4.73	7

Source: Illinois Department of Commerce and Community Affairs

Table 2. Population by Regions (1985)

Region	*Population*	*Percent of State Population*	*Rank*
1	520,605	4.49	7
2	7,466,079	64.44	1
3	1,015,355	8.76	2
4	811,068	7.00	3
5	527,551	4.55	6
6	651,576	5.62	4
7	592,672	5.12	5

Source: Illinois Department of Commerce and Community Affairs

Table 3. Regional Per Capita Income (1985)

Region	*Per Capita Income*	*Percent of State Average*	*Rank*
1	5,383	82.00	4
2	6,816	103.80	1
3	5,654	86.13	3
4	5,318	81.02	6
5	5,709	86.97	2
6	5,373	81.85	5
7	4,696	71.54	7
State Average	6,564	100.00	—

Source: Illinois Department of Commerce and Community Affairs

Regional and Sectoral Effects of the Build Illinois Program

To examine the eventual impact of different types of government expenditures under the "Build Illinois" program, we have performed some simulations. In these simulations, four major sectors of the program: housing, infrastructure, education, and business in each region were perturbed. The amount of money allocated to each of these sectors under the program was distributed among different regions on the basis of either population or manufacturing employment. In particular, housing, infrastructure, and education investments have been distributed on the basis of population while business investments have been distributed on the basis of employment. Direct effects here refer to initial output dollars from various sectors needed to satisfy the set of direct expenditures. The extra output needed to satisfy these direct demand changes will require inputs from other sectors, which, in turn, will require further inputs and so on. Thus, the total effects are greater than the direct effect. The indirect effect is the difference between total and direct effects.

Table 4 shows the impacts of the program on different regions. Impacts on output, employment, and income are greatest in the Chicago region, where the total increase in output is about 160 percent of the initial increase (direct effect) while the total increases in employment and income are 225 percent and 171 percent of the initial increases. Thus, the region has an output multiplier of 1.60 and employment and income multipliers of 2.25 and 1.71. The Chicago region is followed by west central Illinois. Although west central Illinois has the lowest level of manufacturing employment in the state, it is second only to the Chicago region in per capita income. This may partially explain the high value of multipliers in this region compared to other regions. Northwestern Illinois has the lowest output, employment, and income multipliers indicating that it has relatively lower capability for generating economic growth.

Since six of the seven regions are small and do not compare favorably with Chicago, we have grouped them together into one region and calculated the impacts on this basis. The results indicate that Chicago is still the leading region although the differences have narrowed. Thus, the output, employment, and income multipliers for the rest of Illinois are 1.506, 2.018, and 1.587 as against 1.60, 2.25, and 1.71 for Chicago. Because of higher productivity levels and higher concentrations of economic activity, the Chicago region will benefit most if the expenditures of the "Build Illinois" program are based on population and employment distribution. The impact in terms of increases in outputs, employment, and income in the rest of Illinois would be lower, although large variations can be expected across the component regions.

A policy designed to achieve a particular objective must be based on careful analysis. Since policies are often designed to affect specific sectors, it is appropriate to determine the impact of output, employment, and income multipliers on various sectors to evaluate these policies. We have attempted to analyze the spatial variations in sectoral multipliers. Such analyses are helpful in providing policy guidelines for tackling spatial imbalances in development.

Table 4. Program Impact: Output, Employment, and Income Multipliers

Region	*Output Multiplier*	*Employment Multiplier*	*Income Multiplier*
1	1.334	1.811	1.421
2	1.593	2.251	1.710
3	1.453	2.069	1.558
4	1.460	1.999	1.571
5	1.522	2.118	1.630
6	1.400	1.918	1.485
7	1.446	1.889	1.532
Rest of Illinois*	1.506	2.018	1.587

*Includes all regions except Chicago.
Source: Illinois Department of Commerce and Community Affairs

Table 5 represents output multipliers associated with each sector. For each region, the output multipliers corresponding to housing and business appear to be quite similar. Infrastructure, however, has a relatively higher output multiplier in each of the regions. The difference is highest in the Chicago region where housing and business have output multipliers of about 1.55, while infrastructure has an output multiplier of 1.67. Interregional differences in output multipliers for each of the sectors are also observed. Chicago has the highest output multipliers in housing, infrastructure, and business, while northwestern Illinois has the lowest output multipliers in these sectors. The analysis indicates investments in infrastructure are likely to generate more total output than investment in housing or business when considered separately. The location of such investment is also important. Northwestern Illinois appears to be the least productive region while the Chicago region appears to be the most productive.

Table 5. Output Multipliers

Region	*Housing*	*Infrastructure*	*Business*
1	1.310	1.376	1.309
2	1.549	1.670	1.549
3	1.413	1.523	1.412
4	1.421	1.528	1.418
5	1.482	1.582	1.484
6	2.360	1.464	1.361
7	1.416	1.502	1.407

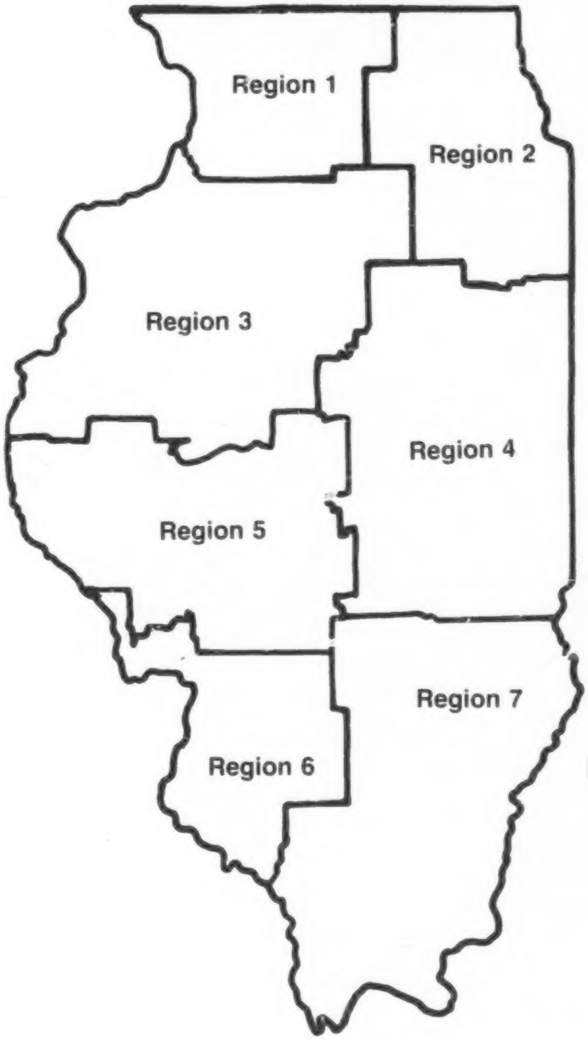


Table 6 gives employment multipliers for each sector and region. It is interesting to note that employment multipliers associated with infrastructure are less than employment multipliers associated with housing or business. Thus, the effects of housing and business sectors on labor-intensive industries are larger than the effects of infrastructure on these industries. Interregional comparisons indicate that, as before, the Chicago region has the highest employment multipliers while northwestern Illinois has the lowest in all the sectors. Interregional variations in employment multipliers are, however, greater than the interregional variations in output multipliers.

Intersectoral and interregional comparisons of income multipliers reveal the same patterns as for employment. Table 7 shows that the income multiplier for infrastructure is lower than that for housing or business. Chicago, again, is the leading region followed by west central Illinois.

Table 8 shows the output, employment, and income multipliers for the non-Chicago regions when they are combined into a single region. When Chicago is compared to this "region," we observe less interregional variation in sectoral multipliers. In housing for example, the output multiplier for the rest of Illinois is about 1.46 compared to 1.55 for Chicago. For five out of six regions comprising the rest of Illinois, the output multiplier is less than 1.46. Similar observations can be made for employment and income.

As the analysis illustrates, the size of a region is very important for analytical purposes. If the objective is to concentrate investments in a small region, selecting a larger region as the unit of analysis would be inappropriate as it would give misleading information about the effects of such investments. The economic

Table 6. Employment Multipliers

Region	*Housing*	*Infrastructure*	*Business*
1	2.069	1.614	2.048
2	2.488	2.032	2.452
3	2.342	1.838	2.363
4	2.237	1.812	2.220
5	2.407	1.893	2.390
6	2.125	1.745	2.147
7	2.082	1.718	2.083

Table 7. Income Multipliers

Region	*Housing*	*Infrastructure*	*Business*
1	1.654	1.276	1.641
2	2.077	1.475	2.054
3	1.839	1.380	1.833
4	1.875	1.387	1.855
5	2.010	1.422	1.996
6	1.740	1.334	1.737
7	1.827	1.351	1.818

Table 8. Sectoral Multipliers for the Rest of Illinois

Multipliers	*Housing*	*Infrastructure*	*Business*
Output Multipliers	1.462	1.581	1.463
Employment Multipliers	2.245	1.823	2.235
Income Multipliers	1.871	1.403	1.853

structure of a region and its relationships with the outside world are also of crucial importance. Analyses for regions similar in size but different in economic structures will yield different results. For example, northwestern Illinois and west central Illinois are very close in terms of population size but the output, employment, and income multipliers associated with west central Illinois are larger than the multipliers associated with northwestern Illinois. Appropriate regionalization is, therefore, a prerequisite for spatial analysis of development programs.

Policy Implications

Our results indicate that the effects of a particular policy vary not only across sectors but also across regions. The main point this study emphasizes is that the locational aspects of government expenditure should be given due consideration. It has been observed that the regions of the state differ greatly in terms of population, employment, and income. The results show that the effects of government expenditures on output, employment, and income in different regions vary significantly. In the Chicago region, for example, each dollar of direct government expenditure indirectly generates 1.59 dollars. In northwestern Illinois, on the other hand, 1.33 dollars would be created indirectly for each dollar of output created directly. The critical question, therefore, is what criteria should be used for distributing government expenditures among different regions.

Calculation of sectoral multipliers in different regions is a useful way of evaluating policies in terms of attaining specific economic objectives. Our study indicates that some sectors exert more influence on employment than others. There is also regional variation. In a region with a lower level of employment, such sectors may be given more emphasis. If the objective is to increase per capita income more rapidly, then sectors that have larger income and output multipliers may be appropriate targets.

The present study is based on single-region input-output models that do not account for interactions between and among different regions. In reality, of course, regional economies are highly dependent on each other. An interregional input-output model is, therefore, a better representation of an economic system. The use of such models will be helpful in tracing the eventual effects of a program on all regions, the sum of which will be greater than the sum of the regional effects calculated in isolation.

Sound policies and programs should stem from a rigorous conceptual framework. Since the "Build Illinois" program envisages large expenditures across a wide variety of industries in the state, careful studies of alternative expenditures are crucial for the program to generate maximum benefits. These studies must concern the implications of sectoral and regional impact of different policies.

Comprehensive and rigorous analyses are required to understand the complex interactions within and among economic regions in order to allocate scarce resources effectively. Models that quantify the complex interdependencies in a regional economic system provide information that can now be used to provide much-needed policy guidelines for the spatial distribution of development expenditures. ▲

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Illinois Business Indexes

Beginning in this issue, each *Illinois Business Review* will publish several graphs of relevant Illinois data series. The data graphed will be obtained from data series currently published in the Illinois Business Indexes table. However, unlike the table, the graphs will include an entire year of each data series. The Illinois Business Indexes table will continue to be published. The presentation of Illinois data series in graphical form is intended to allow readers the opportunity to easily follow economic trends and cycles.

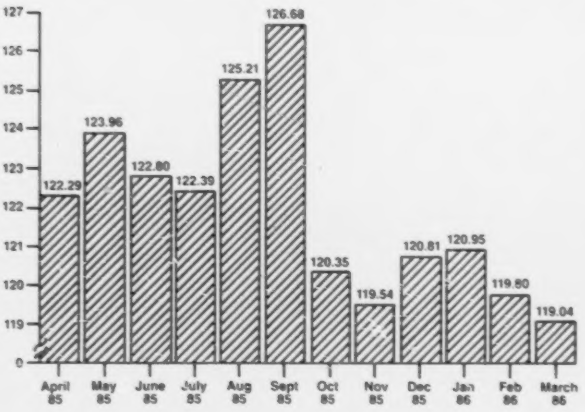
In this issue, six graphs are presented. The coincident indicator is a composite of other Illinois economic indicators. Manufacturing accounts for a large percentage of Illinois employment. Both manufacturing employment and average weekly earnings for manufacturing employees is included. Help Wanted Indexes for Chicago and St. Louis are included. Help wanted indexes allow comparisons of job opportunities to be made between different time periods. Estimates for Illinois' retail sales are also included.

ILLINOIS BUSINESS INDEXES

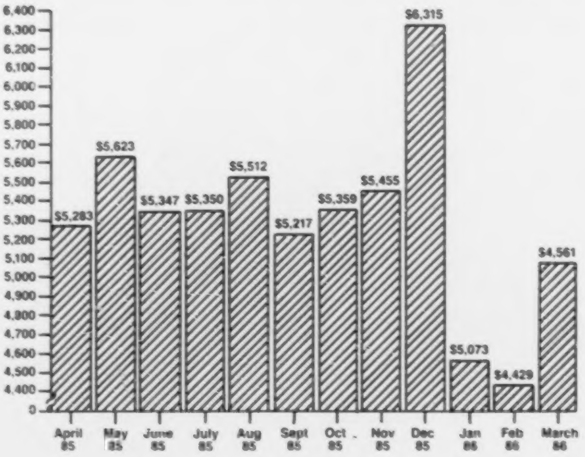
	Percent Change March 1985–March 1986	*March 1986*	*Feb 1986*	*Jan 1986*	*Dec 1985*	*March 1985*	*Feb 1985*
Coincident indicator (1969 = 100)	4.72%	119.04	119.80	120.95	120.81	113.67	112.16
Employment-manufacturing (in thousands)[e]	0.64%	966.5	964.9	962.8	971.1	960.4	964.3
Average weekly hours-manufacturing[c]	0.74%	40.6	40.1	40.7	41.9	40.3	39.6
Weekly earnings-manufacturing[c]	3.78%	$430.36	$422.65	$428.57	$442.88	$414.69	$407.09
Help wanted advertising-Chicago (1969 = 100)[a]	−4.08%	94	93	91	104	98	100
Help wanted advertising-St. Louis (1969 = 100)[a]	−5.41%	70	70	69	67	74	72
Retail sales (in millions)[b]	4.58%	$5,073	$4,429	$4,561	$6,315	$4,851	$4,312
Coal production (in thousands of tons)	4.32%	5,485	5,309	5,813	4,632	5,258	5,098
Petroleum products (in thousands of barrels)[e]	43.01%	3,232	2,707	2,758	2,533	2,260	2,040
Vendor performance[g]	8.70%	50.0%	48.0%	46.0%	46.0%	46.0%	48.0%
Building permits							
Residential housing units (in thousands)	−7.19%	2.247	1.009	0.997	0.950	2.421	1.282
Value of residential housing	39.85%	$204,774	$111,698	$114,224	$165,595	$146,420	$70,824
Value of nonresidential construction							
Industrial buildings	−8.96%	$21,632	$20,295	$18,903	$13,340	$23,761	$4,367
Office, banks, and professional buildings	−87.56%	$8,196	$38,003	$56,652	$61,950	$65,906	$44,259
Stores and other mercantile buildings	146.29%	$38,386	$17,452	$10,822	$21,667	$15,586	$12,466
Other	−70.76%	$1,282	$1,693	$1,718	$4,534	$4,384	$1,318
Consumer price index (December 1977 = 100)							
North Central US[c]	2.45%	—	175.4	—	176.0	—	171.2
North Central/population more than 1,250,000[c]	2.81%	—	179.2	—	179.4	—	174.3
North Central/population 385,000 to 1,250,000[c]	2.36%	—	173.7	—	174.2	—	169.7
North Central/population 75,000 to 385,000[c]	2.22%	—	170.4	—	171.5	—	166.7
North Central/population less than 75,000[c]	1.49%	—	170.7	—	172.6	—	168.2
Chicago (1967 = 100)	2.05%	323.9	326.4	326.3	325.9	317.4	316.7
St. Louis (1967 = 100)	1.56%	319.2	—	322.4	—	314.3	—
		1985:IV	1985:III	1985:II	1985:I	1984:IV	1984:III
Personal income (in millions)[d,e,f]	4.36%	$169,265	$165,131	$166,908	$164,894	$162,200	$160,180
Per capita personal income[d,e,f]	3.34%	$14,492	$14,148	$14,311	$14,148	$14,024	$13,871

[a] The Conference Board, *Help Wanted Advertising*, March 1986. [b] Latest month projected by BEBR. [c] Percent change between February 1985 and February 1986. [d] Percent change between 1984:IV and 1985:IV. [e] Recent month is preliminary figure. [f] Seasonally adjusted at annual rates. [g] Percentage of companies receiving slower deliveries.

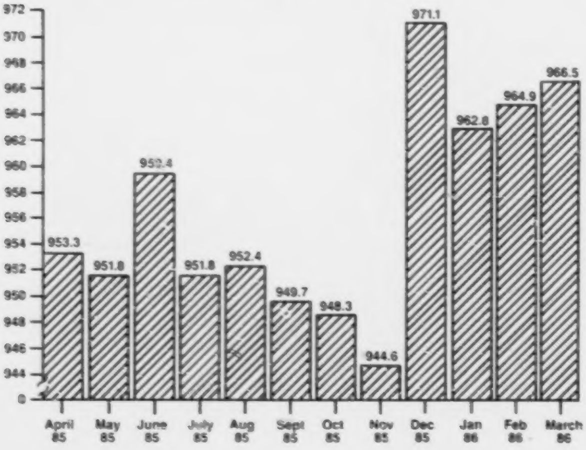
Coincident Indicator (1969 = 100)



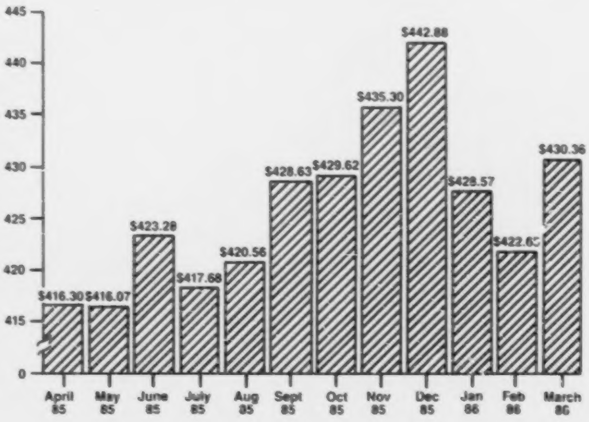
Retail Sales (in millions)



Employment, manufacturing (in thousands)

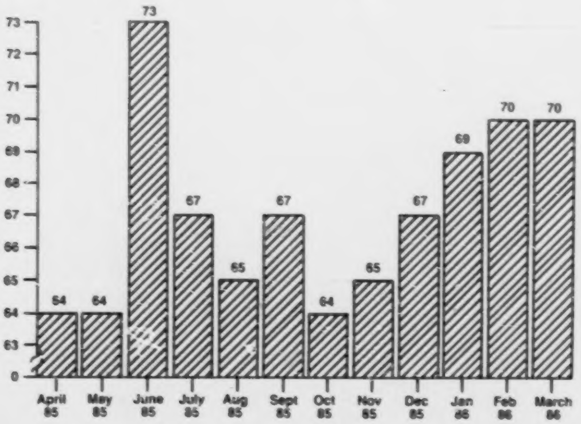


Average Weekly Earnings, Manufacturing



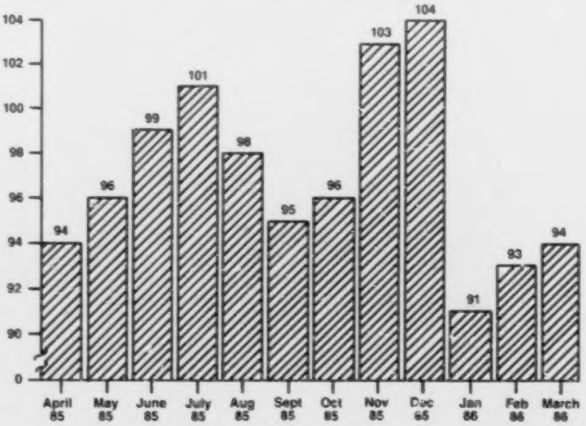
Help Wanted Advertising–St. Louis (1969 = 100)

Source: The Conference Board *Help Wanted Advertising*



Help Wanted Advertising–Chicago (1969 = 100)

Source: The Conference Board *Help Wanted Advertising*



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Illinois Economic Outlook

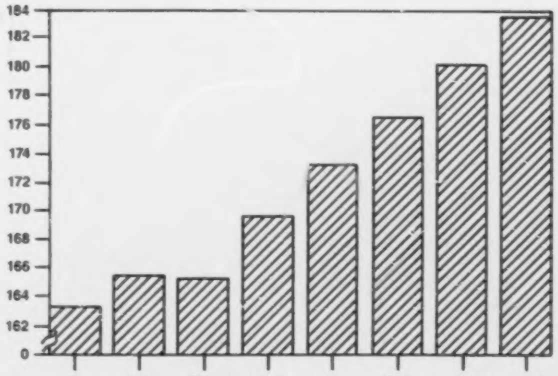
Illinois Personal Income (Millions of Dollars, Seasonally Adjusted Annual Rates) 1985 and Forecasts for 1986.

	(1)	*(2)*	*(3)*	*85:I*	*85:II*	*85:III*	*85:IV*	*86:I*	*86:II*	*86:III*	*86:IV*
Total	165,756	169,625	2.28	163,275	165,481	165,219	169,625	173,206	176,442	180,110	183,465
Total, Private Nonagricultural	102,246	102,608	3.53	98,829	100,020	101,053	102,608	103,896	105,163	106,833	108,428
Mining	1,176	1,103	−6.62	1,163	1,172	1,129	1,103	1,116	1,116	1,121	1,125
Construction	6,183	5,917	−4.50	5,736	5,971	5,967	5,917	6,116	6,253	6,390	6,500
Manufacturing	28,428	29,087	2.27	28,708	28,579	28,149	29,087	29,386	29,692	30,018	30,264
Nondurable Goods	10,633	10,873	2.21	10,682	10,637	10,633	10,873	10,967	11,120	11,253	11,398
Durable Goods	17,795	18,214	2.30	18,026	17,942	17,516	18,214	18,419	18,571	18,765	18,866
Transportations and Utilities	9,876	9,916	0.40	9,341	9,493	9,868	9,916	10,011	10,030	10,111	10,204
Wholesale Trade	9,928	10,116	1.86	9,830	9,903	9,993	10,116	10,278	10,460	10,650	10,846
Retail Trade	10,611	10,563	−0.45	10,202	10,341	10,612	10,563	10,711	10,867	11,018	11,167
Finance	9,671	9,792	1.24	9,236	9,403	9,516	9,792	9,990	10,100	10,305	10,514
Services	26,371	25,785	−2.27	24,310	24,839	25,503	25,785	26,289	26,645	27,220	27,808

(1) — Last Forecast For 1985-IV. (2) — Historical Value For 1985-IV. (3) — Percentage Error In Forecast.

Illinois personal income grew 2.7% in the fourth quarter of 1985, according to figures released by the Bureau of Economic Analysis. For the entire year, it grew 5.2%. The sectors with the largest growth were transportation & utilities and services. The Illinois Econometric Model performed well in terms of personal income for the fourth quarter of 1985. The overall forecasting error was 2.28% (an underestimation), with the only large error being mining (6.6%) and construction (4.5%). The model also predicts continued personal income growth of 7% for 1986.

Illinois Personal Income 1985–1986 (Seasonally Adjusted Annual Rates)



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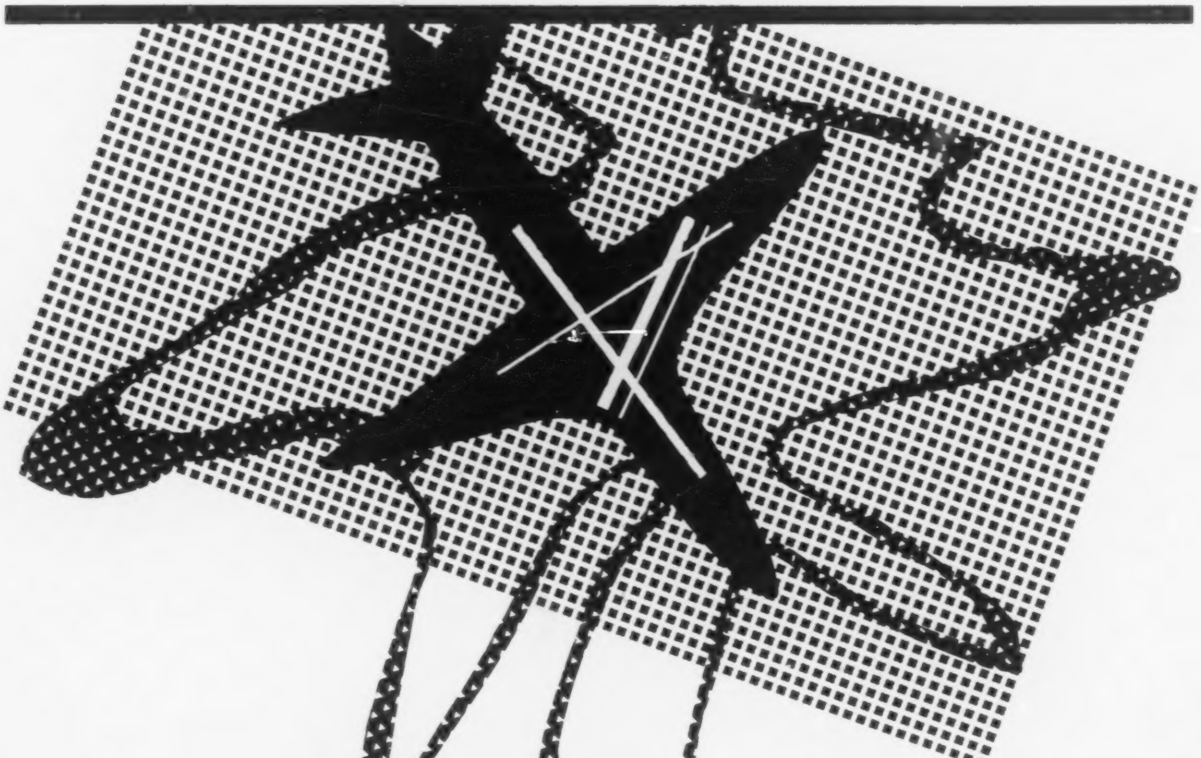

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Signed articles represent the personal views of the authors and not necessarily those of the University or the College of Commerce.

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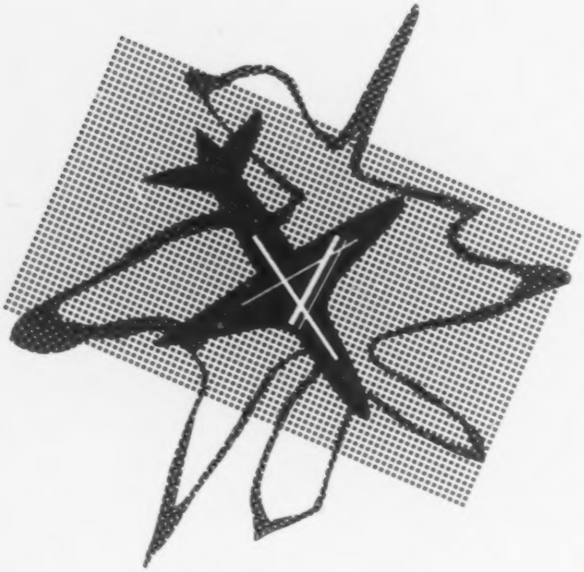
MARVIN FRANKEL

Regulating Noise from Illinois Airports



Over the past 10 to 20 years the environmental problem of noise—from industrial machinery, motor vehicles, aircraft and a host of miscellaneous sources has gained increasing attention. In responding to one segment of this problem, the Illinois Attorney General in February 1977 proposed to the state's Pollution Control Board a plan to regulate and limit noise emissions from the state's public airports. Consistent with its responsibilities under the Illinois Environmental Protection Act, the Board initiated a series of public hearings, and the Department of Energy and Natural Resources sponsored technical and economic studies of probable impact. Over a six-year period (1977 to 1983), the Board held a series of 43 hearings (two additional hearings to update the record were held last September). As might be expected, attitudes toward the proposed regulation of the various affected parties differed. It was generally opposed by the Air Transport Association, the Illinois Public Airports Association, and the Department of Aviation of the City of Chicago, and was generally supported by the Illinois Environmental Protection Agency and by officials and citizens groups in the suburban communities surrounding O'Hare Airport.

In April 1986, some nine years after the Attorney General's initial overture, the Board produced a proposed regulation. As presently drawn, it provides for the phasing in of progressively tighter noise standards. Beginning 1 January 1988 the maximum permissable level of noise emissions from operations at a public airport to any Class A or residential land would be 80 L_{dn}. This would decline to 75 L_{dn} on 1 April 1989 and to 65 L_{dn} on 1 October 1994. The L_{dn} measure, to be calculated as an annual average, is a weighted average of daytime and nighttime (10:00 p.m. to 7:00 a.m.) noise levels and incorporates a penalty for nighttime noise, which is generally found to be more disturbing. A 65 L_{dn} noise level has come to be widely recognized and accepted as the maximum level compatible with the ordinary activities of people in residential areas.

Besides this basic provision, the regulation would prohibit the construction of a new runway at an airport if it would create a noise level greater than 65 L_{dn} on any class A land. In addition, airports are required to prepare, through use of a designated Federal Aviation Agency computer model, noise exposure maps showing the noise contours for the airport and such other data as airport boundaries and runways, aircraft flight tracks, surrounding land uses, and estimates of the number of dwelling units and persons located within each of the several contours. Airports with jet operations are also required to maintain records of the data needed to generate the airport's noise contours and to report the data quarterly to the Illinois Environmental Protection Agency.

There are two circumstances either of which would relieve the airport proprietor of the obligation to meet the noise standards: first, if non-Class A land subject to excess noise is converted to Class A status subsequent to the preparation and filing of the airport's noise exposure map; second, if the airport proprietor has secured a noise easement on Class A land with noise levels in excess of 65 L_{dn}. However, this exception does not apply to noise levels of 75 L_{dn} or greater. The proprietor of an airport in violation, or contemplated violation, may also petition for a so-called adjusted standard that would allow a higher noise level for some specific period of time. The petition procedure is rather elaborate and requires, among other things, discussion and assessment by the airport proprietor of a variety of possible methods for reducing noise, the presentation of a plan for reducing the airport's noise impact, and a schedule for implementing the various elements of the plan.

The Noise Status of Illinois Airports

There are more than 100 public airports in the State of Illinois. The technical and economic study (henceforth Economic Study)[1] carried out in 1980–81 to assess the impact of the proposed noise regulation found that 14 of these airports would be in violation. These airports are identified in the Table, along with estimates of the number of residential dwellings located in the designated noise intervals (see the base case column). All of the airports accommodate jet aircraft. For Vermillion County, Galesburg, Quincy, Waukegan, the number of such operations is quite modest, while for others (Rockford, Peoria, Moline-Quad City, Midway, O'Hare) it ranges from substantial to very large. In all cases, these operations contribute critically to the elevated noise levels. Indeed, the airport noise problem, in Illinois and elsewhere, is essentially a jet noise problem.

The Table indicates that statewide approximately 97,000 dwellings are affected by noise levels in excess of 65 L_{dn}, and about 5,200 of these experience noise levels of more than 75 L_{dn}. The most serious problems downstate in terms of dwellings affected are at the Moline-Quad City and Peoria facilities. For some of the other downstate airports, such as Champaign-Willard, Danville-Vermillion County, Galesburg, and Quincy, the number of affected dwellings is small. The core of the problem lies at the two Chicago airports. The O'Hare and Midway environs combined contain just over 98 percent of the total housing units over 65 L_{dn}, with O'Hare alone representing 89 percent. Virtually all housing units over 75 L_{dn} are located at these two airports. This is not surprising. In downstate areas, with low population and extensive open land, the forces that pack people and housing close to airports are much weaker than in the crowded, land-short areas in and around a major city.

The figures in the Table are based largely on data developed or available around 1980. The O'Hare figures are an exception and relate to 1984. The Noise Abatement Office at O'Hare reports that between 1979 and 1984 the 65 L_{dn} contour has contracted, with the number of dwelling units subjected to noise levels in excess of 65 L_{dn} declining by about 17 percent to the total in the Table of 86,400. It attributes the improvement to the changing composition of the air carrier fleet and, specifically, to the introduction of more modern, quieter aircraft and the retirement of some of the older, noisier vehicles. Since 1980, at other airports, various changes may well have occurred in the volume of traffic, in the types of aircraft arriving and departing, in traffic patterns, in the balance between day and night operations, and in the development of residential land. Such changes could, of course, affect the numbers of dwellings subject to high noise levels. At Midway airport, the number of air carrier operations (though not total operations) has increased over the past several years, and the relative importance of jet operations apparently has increased. Hence, the 65 L_{dn} contour may have grown. Accordingly, it should be understood that the figures in the Table may not give an accurate indication of the current status of individual airports. At the same time, the general impression of the extent of the noise problem in the state and of its relative importance at different locations remains reasonably reliable.

The Adverse Effects of Noise

Noise as a pollutant, depending on its type and intensity, can produce various effects on people. In the case of airport noise, the main effects are recognized to be speech and sleep interference and annoyance. The type of noise emanating from airports is typically variable and intermittent, rather than steady and continuous. As an aircraft passes overhead, the peak noise on some properties adjacent to the airport might average 90–95 dBA outdoors, or 70–75 indoors, rising to this peak as the aircraft approaches and diminishing as it moves away. With each flight, the noise pattern is repeated. For a given residence or group of residences, flyovers are generally irregular in the course of a day, with one or more peak periods and intervals of low activity. There may also be considerable variation because of shifting wind conditions. Such variation may also occur because of efforts by the airport tower to limit the noise impact on a given residential sector. The resulting L_{dn} measure averages the noise levels over the high or peak periods and the moderate and quieter periods.

The noise levels caused by aircraft flyovers disrupts speech and other types of communication. At 90–95 dBA outdoors, speech may be all but impossible for 10 to 20 seconds, and at 70–75 dBA indoors it may be difficult to talk for 5 to 10 seconds. With each flyover, the situation is repeated. In testimony at public hearings before the Pollution Control Board, numerous citizens living near airports complained of difficulty conversing with family members, hearing their televisions or stereos, and using their telephones. Communications problems arise also for institutions such as churches hospitals, and schools located near airports. In schools, classroom instruction may be impaired or completely interrupted for 5 to 30 seconds with each flyover. At an airport like O'Hare, depending on wind direction and traffic, such flyovers may occur every minute or two and may continue for a few or even several hours. The O'Hare Noise Abatement Office reports that as of 1984, 93 schools were located within the 65 L_{dn} contour.

Status of Residential Dwellings at Selected Illinois Airports

	No. of Dwellings in Noise Zone	
Airport	*Base Case*	*With Modified Operating Procedures*
Champaign-Willard		
70-75 L_{dn}	5	NA[c]
65-70 L_{dn}	12	NA
Danville-Vermillion County		
70-75 L_{dn}	0	NA
65-70 L_{dn}	10	NA
Decatur Municipal		
70-75 L_{dn}	6	0
65-70 L_{dn}	142	44
Galesburg		
70-75 L_{dn}	0	NA
65-70 L_{dn}	3	NA
Moline-Quad City		
Over 75 L_{dn}	2	2
70-75 L_{dn}	66	49
65-70 L_{dn}	1,530[a]	177
Mt. Vernon		
70-75 L_{dn}	0	NA
65-70 L_{dn}	40	NA
Peoria		
70-75 L_{dn}	40	2
65-70 L_{dn}	581	252
Quincy		
70-75 L_{dn}	0	NA
65-70 L_{dn}	1	NA
Rockford		
Over 75 L_{dn}	2	NA
70-75 L_{dn}	14	NA
65-70 L_{dn}	9	NA
Springfield-Capital		
70-75 L_{dn}	2	0
65-70 L_{dn}	34	17
Waukegan		
70-75 L_{dn}	0	NA
65-70 L_{dn}	54	NA
West Chicago-DuPage County		
70-75 L_{dn}	9	NA
65-70 L_{dn}	15	NA
Chicago-Midway		
Over 75 L_{dn}	2,000	NA
65-75 L_{dn}	6,000	NA
Chicago-O'Hare		
Over 75 L_{dn}	3,213	[b]
65-75 L_{dn}	83,187	[b]
All Non-Chicago Airports		
Total	2,577	717
Over 75 L_{dn}	4	4
Midway and O'Hare		
Total	94,400	[b]
Over 75 L_{dn}	5,213	

Sources: Base Case column–for the non-Chicago airports, including West-Chicago DuPage County, data are from Table II–1, pp. 5–6, Vol. II of the *Economic Study*. Data for Midway Airport are from the 1977 Master Plan study for that airport. Data for O'Hare Airport are from the 1984 Annual Report of the O'Hare Noise Abatement Office, with the breakdown between the noise zones estimated by the author. Modified Operating Procedures column—Table II–3 and II–4, pp. 22 and 25, Vol. II of the *Economic Study*.

[a] A substantial number of these dwellings are mobile homes.
[b] Modified operating procedures are not yet established at O'Hare (see text).
[c] NA = Not Applicable.

Even lower noise levels also disturb sleep. Noise from passing aircraft may either awaken an individual or cause a change in his sleep level, affecting the quality as well as quantity of sleep. While many people can adapt their sleep to repeated noise exposures, the adaptation is only partial. The frequency of awakening may be reduced, but there is little or no adjustment to disturbances in sleep level. The probability of sleep disturbance and the severity of disturbance increase as aircraft passbys increase in number and noise levels. In general, outdoor noise levels of 45 dBA with windows open and 55–60 dBA with windows closed are considered adequate for uninterrupted sleep. As the noise increases, adverse effects set in. There is greater sensitivity to aircraft noise, and other types of noise as well, in the otherwise quiet late hours, and especially when sleep is disturbed. This accounts for the 10 dBA penalty that is incorporated into the L_{dn} measure for flights occurring between 10:00 p.m. and 7:00 a.m. The occasional night operations at some downstate Illinois airports generate peak sound levels that are well above the disturbance threshholds noted above. At O'Hare Airport, which accommodates a greater number of night flights, the problem is more severe.

Annoyance is a psychological response to a given noise exposure. It may result from speech or sleep interference, but it can arise in a variety of other circumstances. The perceived unpleasantness of the noise is a factor in annoyance, as is any anxiety or apprehension that the noise might cause. In studies done with jet noise, one of the factors adding significantly to people's annoyance was their implicit fear of a plane crash. Other factors influencing the degree of annoyance are the frequency and duration of the noise, the time of day that it occurs, its informational content, and the background noise against which a particular noise occurs. A person's attitude toward the noise source can also be important. For example, an airline or airport employee who sees air travel as a source of employment and economic security may experience less annoyance in a given circumstance than, say, an employee of a library subject to overflights. Noise levels need not be high to cause annoyance. Levels of 50–55 L_{dn}, well below those set in the proposed regulation, will cause annoyance to a nominal fraction of the population.

Medical research has established that high noise levels can produce a number of physiological effects of consequence, including hearing loss, cardiovascular stress, blurred vision, colitis, and migraine headaches. Such noise levels can also aggravate existing physical and mental health problems. While the state of research in this area remains unsettled in certain respects, it seems generally to be agreed that the noise levels around airports are not sufficiently high to produce these sorts of effects, at least not to an extent that warrants public concern. The present, predominant view of the burdens imposed by aircraft noise is much the same as that expressed in a 1976 FAA statement on noise abatement policy:

> Aircraft noise disturbs the normal activities of airport neighbors—their conversation, sleep, and relaxation—and degrades their quality of life. Depending on the use of land contiguous to an airport, noise may also affect education, health services, and other public activities.
>
> Although there may be indirect and subtle social and psychological harms, aircraft noise is predominantly an annoyance problem. It does not present any direct physical health danger to the vast majority of people exposed (quoted in the Pollution Control Board's Proposed Opinion and Order, p. 71).

As a corollary it may be noted, that in contrast to many other pollutants, the effects of noise are transient and noncumulative. Once the source is removed, there are no lasting impairments.

The Rights, Wrongs, and Complexities of Airport Noise

Situations of environmental pollution are commonly thought of as involving two parties, transgressors (polluters) and victims. The latter are seen to suffer burdens imposed by the extra-legal or improper actions of the former, and are accordingly entitled to relief. The case of airport noise is more complicated.

An airport requires a large amount of flat, open land. Large expanses of land are ordinarily available only at the edge, or some distance from, built-up areas. Thus, when first constructed, an airport may have little or no housing nearby, and the noise impact from its operations is small or negligible. Over time, the airport may grow through physical expansion and an increase in the number of aircraft operations. Concurrently, people who seek housing, and the real estate developers who serve them, are drawn to locations around the airport. They are attracted by some of the same factors that earlier attracted the airport—vacant land and good drainage. They are attracted also by the supplies of water and power that have become available, by good access to road and air transportation, and by the economic activity that the airport supports and generates. The airport and residential land thus become juxtaposed, making conflict all but inevitable.

The introduction in 1958 of the commercial jet transport, with its substantially increased requirements for acoustical space, greatly intensified the opportunities for conflict and increased the scale that conflict might attain. Land proximate to the larger airports began to experience significantly elevated noise levels, and land that earlier had seemed distant from the airport became subject to disturbing noise levels. Increasing numbers of households found that, whereas their residential surroundings previously had been relatively quiet, they now were subject to noisy overflights.

Interestingly, the initiation and expansion of jet traffic seemed not to inhibit residential development around airports. The Pollution Control Board, in issuing its recent opinion and order on the proposed regulation, cited a number of examples of this phenomenon that had been reported during the lengthy series of hearings. In Bensenville, a suburban community bordering O'Hare, the population grew 40 percent from 1960 to 1970, while in nearby Wood Dale the population rose over 175 percent in the same period. In several other townships in the area, over 500 single-family dwellings were built between 1970 and 1978, and over 800 multiple family units were constructed on land with noise levels of 75 L_{dn} or greater. The airport manager for Springfield Capital reported that the airport authority had objected to 12 cases of zoning near the airport and had lost all of them. Other instances of close-in incompatible development were reported for the Quad Cities and Decatur airports. These examples highlight the fact that control of zoning for residential development and control of the airport and its development rest with different jurisdictions.

Midway Airport presents a sharply contrasting situation to those just cited, with changing aircraft technology playing the central role. The neighborhoods surrounding the airport were well-established prior to 1960, with less than 15 percent of the housing in the area being built after that date. The noise from propeller-driven aircraft was not regarded as a serious problem. The introduction of jet aircraft raised noise levels very substantially, and areas previously comparatively quiet became subject to significant noise. At certain other airports, simple airport expansion has produced a similar result. The extension of a runway or addition of a new runway, possibly accompanied by increases in traffic, has altered noise contours, bringing higher noise levels to existing residential areas. The conflict between airport users and nearby residents thus results from the intermixture of several forces. Many of those living in noise-affected dwellings moved to those dwellings after the airport and its noise patterns were established. Some were attracted by new residential developments whose location was ill-conceived and improperly controlled. Others purchased existing properties as they came up for resale. In both cases, one might reasonably suppose that the purchasers had some awareness of the nearby airport and its noise. In contrast, others living near an airport may be fairly regarded as victims of factors beyond their control, such as changes in aircraft types or expansion of the airport and its activities.

Neighborhood amenities such as good schools, good roads, good police services, and attractive nearby parks tend to be capitalized into property values. So also do neighborhood disamenities. Thus, one expects a property enjoying one or more such amenities to be worth more, other things equal, than a similar property without them. By this reckoning, a residential property burdened by a noise level of, say, 75 L_{dn} should be worth less than a similar property experiencing only 70 L_{dn} and still less than one subject to 60 L_{dn}. Many economic studies have been made of the relation between aircraft noise and residential property values. While the results are not definitive, they suggest, on the average, about a 0.6 percent decline in property value per decibel increase in the noise level. The discount represents compensation for the future noise burden a buyer expects to bear. Alternatively, the same .6 percent per decibel, if paid to the existing occupants, would effectively compensate them, in present value terms, for the future noise burden they would carry. It is important to bear in mind that from an economic point of view, appropriate compensation to the bearer of an environmental burden is, for that person, equivalent to the elimination of that burden through some suitable means of abatement. In either case, the individual has been "made whole" by being restored to his prepollution level of satisfaction. Against this backdrop, we can classify noise-affected households into four broad groups. First, there are homeowners who came to their locations when these locations were quiet, either because no airport yet existed or because the scope of its operations was limited, and who later became subject to aircraft noise. Second, there are former homeowners, in all aspects like the preceding group, except that subsequent to the introduction of aircraft noise they sold their homes, accepting the markets discounted value, and moved elsewhere. Both of these groups are, in a meaningful sense, true victims of noise pollution. Third, there are homeowners presently resident in the noise-affected area who purchased their dwellings at a discount from the second of the above groups. Fourth, there are the occupants of rental property in the noise-affected area who, because of the noise, pay lower rents for their units than the market would otherwise require. Since both of these latter groups are compensated for their noise burdens, neither can properly be viewed as a victim. Renters, it might further be noted, are a mobile and transient group. Since the average renter remains in a given location for a comparatively short period, his noise exposure tends to be limited.

A final point on property valuation deserves mention. To the extent that airport noise is reduced, other things remaining unchanged, the values of properties surrounding the airport should rise. But it does not follow from this that the elimination of the airport would be favorable to the value of these same properties. The reverse would doubtless result in many cases. Airports are focuses of economic activity. The income they generate, the employment opportunities they provide, and the transportation access they afford all help to support and enhance the property values of nearby communities. We do not know the magnitude of this positive force, but it surely helps to compensate for, and in some instances may more than offset, the losses due to noise. The goal of abatement obviously must be to control and limit the effects of noise without impairing value-generating airport activities.

Methods of Abatement and Their Implications

There are several methods for reducing aircraft noise or mitigating its impact. First, a noisy aircraft may be replaced with a later generation, quieter machine, or its engines may be replaced or retrofitted to reduce noise. Second, the manner of operating the aircraft may be modified. Within limits, its landing and departure profiles can be changed and selected runways can be used so as to reduce noise emissions to residential properties. Third, sound-absorbing earthen berms can be strategically placed on an airport to reduce the transmission of engine testing and run-up noise. Fourth, actions that directly involve the noise receivers can be taken. Dwellings can be insulated to reduce noise pass-through, noise emission rights can be purchased from homeowners, and clear areas can be established by purchasing and converting or demolishing residential structures in high noise areas. Finally, the activity level of an airport can be reduced. Night flights, which carry a penalty in the L_{dn} noise measure, can be reduced or eliminated, and the number of day flights can be restricted.

More than a decade ago, the Federal Aviation Administration prescribed noise standards to be met by the air carrier fleet and future dates for achieving compliance. Under those standards, the fleet has gradually become quieter as new generation aircraft have been introduced and older aircraft retired or retrofitted with quieter engines. At present, close to 90 percent of the US fleet has achieved what is called Stage II compliance, and movement continues toward the eventual attainment of Stage III compliance.

Opportunities for application of the remaining abatement methods depend on the conditions at individual airports. Some of these methods are of relatively low cost, while others are more expensive. Changes in aircraft operating methods are generally low cost and, in some conditions, can yield substantial reductions in noise levels. The purchase of noise emission rights, or easements, can entail significant costs, depending upon the number of dwellings involved. Such easements may cost from 2.5 percent to perhaps 17 percent of property value, depending upon the noise status of the property. The noise insulation of dwellings is yet more expensive, with the cost, like easements, also varying with the noise status of the airport. The Economic Study put the average cost of insulating a noise-affected dwelling at a downstate airport at $3,300, compared to an average easement cost of $1,500. The cost of property acquisition and demolition, with properties being purchased at their market values, is of course much higher than either of these approaches. Cutbacks in the volume of operations generate complex repercussions, and the costs are not easily estimated. But such cutbacks are implicitly very expensive since, depending on their type and extent, they disrupt and otherwise compromise the air transportation system.

The Economic Study found for the non-Chicago airports that changes in aircraft operating procedures—the use of preferential runways, modest changes in climb profiles after takeoff, and adjustments in traffic patterns for arrival and departure—would be applicable at Decatur, Peoria, Moline-Quad City and Springfield. These changes would reduce the total of dwellings at the non-Chicago airports subject to more than 65 L_{dn} by over 70 percent, from 2,575 to 717. The outcome is summarized in the third column of the Table. Overall, for the 12 airports, the remaining problem is nominal. Over half of the housing over 65 L_{dn} is concentrated at two airports, Peoria and Moline-Quad City, with the balance scattered among the other 10 facilities. Compliance with respect to these dwellings might be achieved by any of the several methods discussed earlier. The least costly would be the purchase of noise easements. Alternatively, some combination of easements and noise insulation might be used, though at somewhat higher cost. Insulation, it should be noted, is only a partial remedy, since it has no effect on outdoor noise levels. Moreover, it is not clear from the proposed regulation that this approach would constitute an acceptable method of compliance. The regulation, it should also be noted, provides that easements are not an acceptable method of compliance for properties subject to noise levels of 75 L_{dn} or more. For those properties, acquisition by the airport authority would presumably be necessary. It is easy to make a case, on economic grounds, that this provision lacks a rational basis.

The near-term noise problem at downstate Illinois airports appears manageable through the application of one or more of the mitigation methods described, though in certain instances the airport authorities may need to request an exemption from the noise limits (as described later). But a longer-term problem will remain. Jet traffic at some airports will grow over the coming years, pushing up the noise level, though this force will be offset in some degree through a changing fleet mix that incorporates quieter aircraft. More important, in the absence of countervailing policy, residential development around airports, including development within moderate and even high noise zones, can be expected to continue. The result will be an intensification of present effects or the undoing of favorable effects from any abatement measures that may have been taken. The proposed regulation requires that the proprietors of airports in violation of the standards make good faith efforts to persuade local zoning authorities to prevent development on existing or prospective noise-sensitive lands, and this could have beneficial consequences. Further, an airport proprietor is exempt from violation if non-Class A land is converted to Class A or residential land subsequent to disclosure, through publication of a noise contour map, of the noise level on that land.

The situation at the Chicago airports, both for the near and the longer term, is less tractable. O'Hare airport, the busiest such facility in the world, in 1985 supported about 750,000 operations, of which about 12 percent were at night. Over 75 percent of these operations are by large air carrier-type aircraft, and over 95 percent of them are by jet aircraft. About 86,000 housing units are presently contained within the 65 L_{dn} contour. The Economic Study suggested that modified day and night operating procedures could, by themselves, bring about a substantial shrinkage in the noise-affected area and in the number of affected housing units. The feasibility of these changes remains to be tested in O'Hare's complex operating environment. Meanwhile, in 1984 the airport tested a set of modified procedures for nighttime operations, involving the use of preferential runways and preferential flight paths intended to direct more departing aircraft over nonresidential areas. The results have not yet been published, but it appears that the procedures successfully reduced the size of the 75 L_{dn} contour but not the 65 L_{dn} contour. The airport has also undertaken and partially completed a program of constructing noise-attenuating earth berms at strategic locations around the airport, and it has underway a program for assessing alternative procedures for noise abatement during aircraft departures. These steps will doubtless achieve a measure of success, but will still leave perhaps 50 to 60 thousand dwelling units within the 65 L_{dn} contour. As was indicated for the downstate airports, the least costly method of treating the remaining dwellings would be through the purchase of noise easements. The cost for those dwelling units in the 65–75 L_{dn} interval might run in the neighborhood of $100 million to $120 million. The remaining dwellings might be noise-insulated at appreciably higher per unit costs (and without any assurance that this action would bring compliance), for an outlay of perhaps $75–$85 million. These costs might be defrayed over, say, a five-year period through an increase in landing fees charged to airlines or by passenger ticket surcharges. An alternative approach for the estimated 3,200 dwellings located above 75 L_{dn} would be their purchase by the airport authority. This approach would be expensive, carrying an aggregate cost of perhaps $235 million. This cost might be reduced somewhat through redevelopment of at least some of the acquired land. However, from an economic vantage point, property acquisition even with allowance for a redevelopment offset, is difficult to justify.

Midway airport currently supports about 190,000 operations per year, or about one-quarter of the number of its neighbor to the north. The opportunities for noise abatement at the airport are unfortunately limited by its size or compactness, its geography and its constrained pattern of operations, with residential properties around it to the east, west, and north and, with a gap, to the south. Because of this residential pattern and restrictions arising from runway lengths, there is little opportunity for noise abatement through the kinds of operational changes considered for O'Hare. The mitigation options that remain are the relatively expensive ones of easements, insulation, and property acquisition. Thus, despite the lesser scale of Midway's noise problem, the obstacles to achieving compliance appear fully as great as those at O'Hare. The problem could grow in the future since the 1984 master plan study for the airport projects significantly enlarged noise contours for 1995.

In its discussion of the proposed regulation, the Pollution Control Board refers to the noise problems at O'Hare and Midway as "massive" and recognizes that a solution is not attainable in the short run. It appears to acknowledge the limited reach of its own powers, as well as the powers of airport proprietors, in the following comment:

> This Board by itself cannot solve the noise problem. Units of federal, state, and local government as well as the courts, industry, the real estate industry, developers, proprietors, and potential buyers and sellers of homes must all participate to some extent if progress is to be forthcoming. For its part, the Board will establish a noise standard for public airports and require that certain information be made available to the public. This action will make a small, but hopefully significant, dent in a very large problem. The authority and ability to zone around airports, develop and purchase quieter aircraft, alter flight operations, and educate the public about potential noise problems rests with other entities (*Proposed Opinion and Order*, pp. 115-16.)

In anticipation of compliance difficulties, the Board provides in the regulation, as previously noted, for an adjusted standard that might be sought by an airport unable to meet the prescribed noise limits. It is certain that the two Chicago airports will apply for such a standard, and it is probable that several non-Chicago airports will do the same. It is also virtually certain, based on events to date, that the power of the Board to adopt the regulation will be challenged in the courts and that subsequent enforcement actions for violations will be similarly challenged. Hence litigation is in prospect for the coming years. Finally, at the political level, the recent controversy over a proposed regional airport authority for the Chicago area appears destined to continue.

[1] *Economic Impact of Proposed Noise Regulations*, R77-4, Illinois Institute of Natural Resources (subsequently the Department of Energy and Natural Resources), 1981, in four volumes. Volume 1, *Technical Study of Public Airports Outside Chicago*, by Paul Schomer, R. W. Findley, and Marvin Frankel; Volume 2, *Economic Analysis of Public Airports Outside Chicago*, by Marvin Frankel and Lise Zwisler, Volume 3, *Technical Study of O'Hare and Midway Airports*, by Paul Schomer, Volume 4, *Economic Analysis of O'Hare and Midway Airports*, by Marvin Frankel and Lise Zwisler.

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ARTHUR GETIS

Economic Well-Being among Chicago's Suburbs

Between 1970 and 1980 the city of Chicago lost over 150,000 manufacturing jobs. During the same period over 300,000 people left the city. This outmigration is comparable in absolute terms to the volume of inmigration around the turn of the century. Contrary to the views expressed in the popular press, however, the vast majority of those people migrated not to the Sunbelt but to Chicago's suburbs. Taking into account the natural increase in population, the suburbs overall have grown in population at a slightly slower rate than the city has declined. The migration to Chicago's 200 suburbs, however, has been uneven. Now after 20 years of large-scale outward movement, the result is about 30 burgeoning suburbs, with the remainder equally divided among no-growth and declining municipalities.

In this article, a shortened version of a longer, more technical research paper to be published in *Economic Geography* late in 1986, I will show that growth is associated with the favorable economic health of suburban municipalities and that geographic patterns of well-being imply that poor community health spreads like a communicable disease. In addition, I will present two rankings of municipal economic well-being that are used to compare the quality of the current economic environment and the recent trends in economic health for 183 suburban communities for which adequate data are available.

Because of our reliance on census data, we must restrict our study to the period ending 1980. The enormous amount of economic activity in the vicinity of Oak Brook since 1980 is not considered in this study.

One can discern at least two types of unhealthy communities: (1) those with unfavorable levels of important socioeconomic variables (such as low per capita income and high crime rates) and whose trends in those variables are either stagnant or negative; and (2) those communities that are better off in key variables but whose recent trends are unfavorable. The healthiest communities have advantageous and improving levels in such key variables as employment, unemployment, persons below the poverty level, and bond rating. The view taken here is that economic health is best viewed as a function of recent trends in key variables, except if communities are so well off that there is "nowhere to go," or if current levels are so depressed that even a modest positive trend can do little to improve economic well-being.

Before developing a model of economic health, we analyzed the relationship between 21 variables for 39 of the largest municipalities in the Chicago Standard Metropolitan Statistical Area (SMSA). The main purpose was to attempt to identify the motive variables, that is, the variables that generate trends in other variables, but that are not generally subject to feedback effects from the variables they affect (exogenous variables). We identified two such variables: change in unemployment and change in employment. Another purpose was to find the appropriate response variables, that is, those variables that best reflect the effects of explanatory variables such as the exogenous variables. With the use of correlation analysis and factor analysis, the main response variable—the current proportion of the population below the poverty level—was chosen as the best indicator of economic well-being. Chart 1 depicts the series of relationships.

Chart 1. Causal Structure for Municipalities in the Chicago SMSA Showing Statistically Significant Paths between Variables

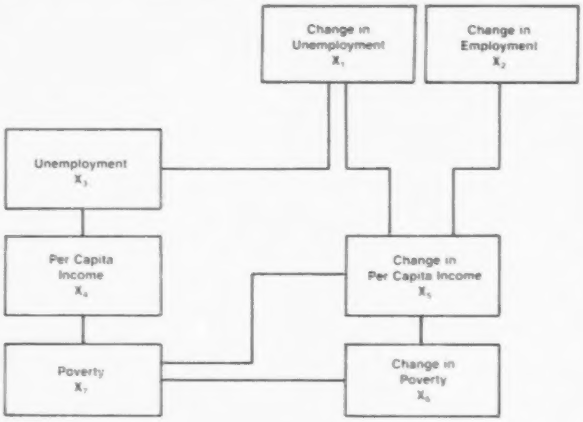
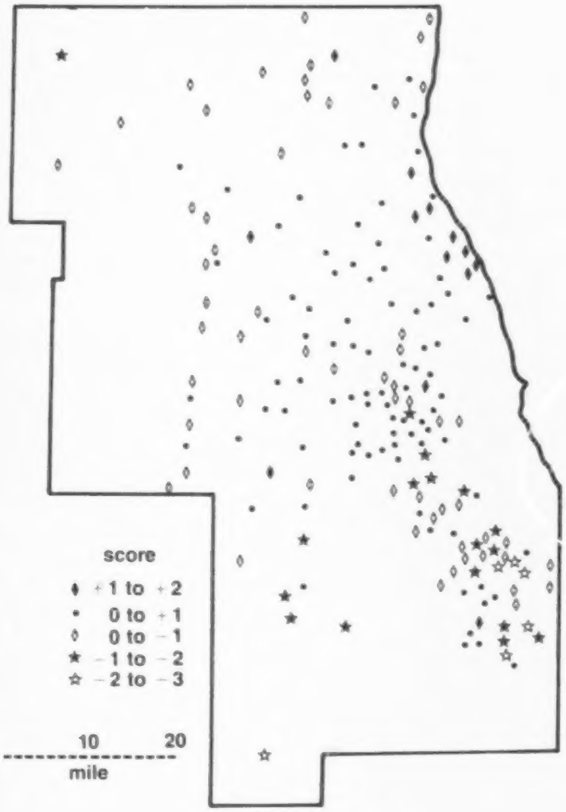

Change in Unemployment X_1
Change in Employment X_2
Unemployment X_3
Per Capita Income X_4
Change in Per Capita Income X_5
Poverty X_7
Change in Poverty X_6

Table 1. Top and Bottom 25 Municipalities in the Chicago SMSA by Level and Trend Scores

	Level	*Score*		*Trend*	*Score*
1	Glencoe	1.68	1	Lincolnshire	2.09
2	Lake Forest	1.46	2	Schaumberg	1.72
3	Winnetka	1.44	3	Thornton	1.51
4	Barrington Hills	1.24	4	Orland Park	1.42
5	Kenilworth	1.22	5	Hazel Crest	1.37
6	Northfield	1.17	6	Warrenville	1.29
7	Wilmette	1.16	7	Woodridge	1.26
8	Olympia Fields	1.15	8	Bartlett	1.17
9	Lindenhurst	1.12	9	Lindenhurst	1.09
10	Highland Park	1.11	10	Palos Hills	1.09
11	Naperville	1.06	11	Algonquin	1.03
12	River Forest	1.05	12	Lake Forest	1.01
13	Deerfield	1.03	13	East Dundee	.95
14	Glenview	.97	14	Winfield	.94
15	Hinsdale	.97	15	Bolingbrook	.91
16	Flossmoor	.94	16	Lisle	.89
17	Northbrook	.89	17	Crestwood	.88
18	Skokie	.89	18	North Aurora	.76
19	Western Springs	.88	19	Northbrook	.71
20	La Grange Park	.87	20	Bloomingdale	.69
21	Lincolnwood	.86	21	Chicago Ridge	.67
22	Elmwood Park	.84	22	Crete	.67
23	Lake Bluff	.84	23	Barrington	.66
24	Lincolnshire	.84	24	Buffalo Grove	.66
25	Berkeley	.83	25	Oak Brook	.65
159	Waukegan	−.83	159	Venetian Village	−.68
160	Blue Island	−.93	160	Stickney	−.69
161	Round Lake Beach	−.97	161	Gages Lake	−.71
162	Calumet Park	−1.01	162	Willow Springs	−.74
163	Justice	−1.07	163	Calumet Park	−.77
164	Chicago Heights	−1.12	164	Carol Stream	−.77
165	Romeoville	−1.25	165	Aurora	−.79
166	Joliet	−1.29	166	Posen	−.83
167	New Lenox	−1.31	167	Cicero	−.84
169	Maywood	−1.33	168	Summit	−.90
170	Bridgeview	−1.36	169	Round Beach Park	−.91
171	Hometown	−1.37	170	Blue Island	−.92
172	Markham	−1.42	171	Markham	−.95
173	Harvard	−1.53	172	Steger	−.95
174	Sauk Village	−1.56	173	Joliet	−1.15
175	Summit	−1.56	174	Melrose Park	−1.16
176	Crest Hill	−1.57	175	Rosemont	−1.18
177	Robbins	−1.57	176	Wilmington	−1.26
178	Dixmoor	−1.99	177	Robbins	−1.28
179	East Chicago Hts.	−2.31	178	Chicago Heights	−1.42
180	South Chicago Hts.	−2.78	180	Maywood	−1.76
181	Wilmington	−2.81	182	Stone Park	−1.97
182	Harvey	−3.20	182	Phoenix	−2.05
183	Steger	−3.55	183	Harvey	−2.76
184	Phoenix	−4.16	184	East Chicago Hts.	−2.79

Chart 2. Scores for the Trend Model for Municipalities in the Chicago SMSA



Indices of Economic Health

Using this model and a statistical technique known as the path analysis, it is possible to construct indices (or scores) of the economic health of a community. The exact procedure is described fully in the forthcoming article. Here, attention is focused on the results of the analysis. Table 1 gives the names of the top and bottom 25 municipalities and the scores associated with their economic health by level and trend. The scores are normally distributed with a mean of 0 and a standard deviation of 0.87. Table 2 focuses upon changes from 1970 to 1980. The following are some conclusions based on these scores.

(1) The well-to-do North Shore and northwest suburbs demonstrate high current levels of health, but they are less highly rated on the trend scale. This is a function of the "nowhere to go" syndrome that is not necessarily indicative of favorable economic health.

(2) The old industrial suburbs are at a low level of current health *and* show negative economic trends. In terms of the actual values for each of the variables, the communities near the bottom of the list are no better off than if they were located in Third World countries.

(3) Further study shows that the bottom 25 suburbs in both categories contain most of the black suburban population. Only in such places as Broadview, Evanston, and Bellwood are there substantial numbers of blacks in moderate or well-to-do suburbs. The outward migration from Chicago has been selective: the segregation level in the suburbs is among the highest in the United States.

(4) The top 25 communities on the trend scale contain 8 of the 20 growing suburbs (see Table 2). Population growth from 1970–1980 correlates with the trend ranking at the +.42 level. Clearly, this shows that not only does rapid growth correspond to increases in employment, but it also correlates with increasing per capita income and favorable trends in poverty levels. People who migrate to the suburbs tend to be at a higher income level than are those who already live there.

Table 2. Fastest Growing Municipalities in the Chicago SMSA from 1970 to 1980

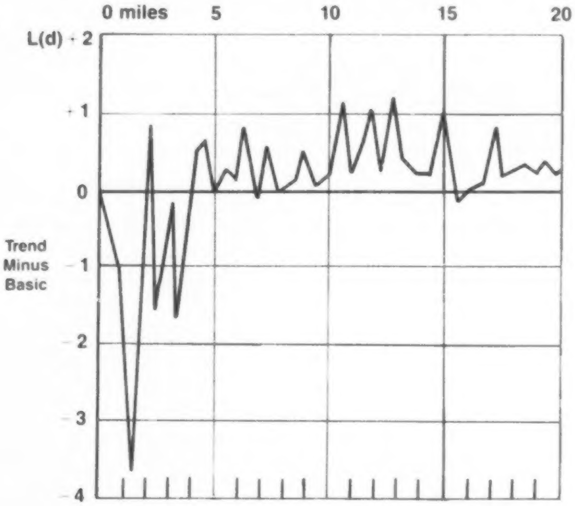
	Absolute Increases			*Percentage Increases*	
1	Schaumburg*	34,824	1	Bolingbrook*	387.0
2	Bolingbrook*	29,610	2	Bloomingdale*	325.7
3	Naperville	19,807	3	Bartlett*	278.6
4	Mount Prospect	17,639	4	Richton Park	267.6
5	Hanover Park	16,984	5	Orland Park*	260.6
6	Orland Park*	16,654	6	Carol Stream	248.9
7	Hoffman Estates	16,020	7	Schaumberg*	187.7
8	Tinley Park	13,606	8	Roselle	173.0
9	Wheaton	11,905	9	Gurnee	162.7
10	Glendale Heights	11,757	10	Lisle*	155.7
11	Carol Stream	11,038	11	Palos Hills*	151.2
12	Roselle	10,827	12	Hanover Park	145.8
13	Woodridge*	10,735	13	Warrenville*	129.2
14	Downers Grove	10,147	14	Countryside	128.3
15	Palos Hills*	10,025	15	Round Lake	126.0
16	Wheeling	10,023	16	Matteson	115.6
17	Buffalo Grove*	9,897	17	Country Club Hills	112.1
18	Bartlett*	9,753	18	Tinley Park	108.2
19	Bloomingdale*	9,685	19	Glendale Heights	103.1
20	Elk Grove Village	8,333	20	New Lenox	102.9

*In top 25 of trend rankings.

Spatial Pattern of Economic Health

The regional map shows the spatial distribution of the trend scores. An analysis was carried out that attempts to identify spatial autocorrelations among the trend scores. High spatial autocorrelation implies that there is an association among nearby municipalities because they display similar scores. Our measure of spatial autocorrelation took into account (controlled for) the spatial clustering of suburban municipalities. From the regional map it is clear that there are pronounced pockets of decline. This shows up in Chart 2 as a consistent, statistically significant, pattern of negatively associated municipalities.[1] Unlike municipalities with positive trends, those with negative trends are decidedly spatially grouped. An inference from this is that municipalities with negative scores, more than those with positive scores, tend to display epidemiological characteristics.

Chart 3. Differences in Indicator Values [L(d)] between the Trend Model Results and the Basic Spatial Pattern of Municipalities by 0.5 Mile Increments



Conclusion

The city of Chicago has been the great generator of economic change in its metropolitan area. Although some communities in the outer suburbs may appear to be independent of trends in Chicago, many are the beneficiaries of the city's recent economic decline. The fastest growing suburbs are now as far as 30 miles from the Loop. As the number of Chicagoans of middle and upper income declines, however, the ability of Chicago to fuel economic advances in the suburbs will inevitably diminish. It follows that what now are the outer suburbs will begin to experience the decline now evident in the inner suburbs. Currently, for middle income people there is a perceived need to escape declining communities; this results in further deterioration. Favorable economic health will come to the city of Chicago and its declining suburbs only when residents see economic advantages in nonmigratory behavior. Officials of declining municipalities would do well to rethink their policies toward those real estate and business interests that are willing to consider developing attractive housing and employment centers closer in.

Our study has highlighted the extreme differences in trends in the suburbs of a single large metropolis. Even with many healthy communities, one cannot consider the Chicago SMSA to be economically sound until the disparities between communities are brought within bearable limits. Since the economic well-being of the municipalities is dependent on their neighbors and on Chicago, it would be in their best interests to develop region-wide plans for growth, preservation, and development.

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[1] The diagram shows values of $L(d)$, a measure of association among communities at different distances from one another. Positive values imply that municipalities with similar high positive scores are spatially related while negative values mean that municipalities with negative values are spatially related. Chart 2 shows that the negative values dominate over short distances (up to 3.5 miles). This means that neighboring communities with strong negative values are spatially related.

Arthur Getis is a professor of geography at the University of Illinois at Urbana-Champaign. This research was sponsored in part by the Office of Real Estate Research at the University of Illinois at Urbana-Champaign.

JAMES R. FOLLAIN

Should Real Estate Brokers Support Tax Reform?

The tax reform movement that began in earnest nearly two and one-half years ago has gained substantial momentum in the past month because of the tax reform plan passed by the Senate Finance Committee (SFC). The SFC plan represents substantial tax reform and many groups around the country have joined the tax reform bandwagon. Senator Packwood, the Chairman of the Senate Finance Committee, was recently quoted as saying that he has never seen such a broad spectrum of support for a piece of tax legislation.

It has been claimed by some that the real estate industry should be less than enthusiastic about the kind of tax reform represented by the SFC plan. The fear is that this reform will cause serious damage to the real estate industry, in general, and the housing market, in particular. As a result, some organizations that represent the real estate industry have lobbied against the SFC plan and urged their members to do so as well.

For the past year I have studied the various proposals put forth by the Treasury Department, the President, the House of Representatives, and, now, the Senate Finance Committee. I have just edited a book that contains my analysis and that of many others entitled *Tax Reform and Real Estate.* An addendum to that book entitled "The Impact of the Senate Finance Committee's Plan for Tax Reform on Real Estate" by Patric Hendershott and me is also available. Based upon this body of work, I feel much of the concern expressed by the real estate lobbying organizations is overstated. Indeed, I would like to argue that tax reform à la the SFC plan is a good idea for the long-run interests of both the real estate industry and the real estate brokerage profession.

There are four reasons why the real estate brokerage industry should support tax reform. The first and foremost is that tax reform will result in a more efficient allocation of our existing capital stock. Currently, the decision to invest is too heavily influenced by noneconomic considerations. That is, the tax consequences of an investment rather than its economic return often dictate whether an investment should be undertaken. In the real estate industry, this has resulted in a huge shift in resources into "tax driven" real estate deals. Furthermore, these deals too often are conducted by people expert in the tax consequences of the investment but unfamiliar with the economic consequences. Tax reform will force future investors in real estate to give more weight to the economics of the investment. In the long run, this must be good for the real estate industry and the professional real estate people who serve it.

Second, tax reform means lower interest rates. Each of the major reform proposals under consideration calls for substantially lower marginal tax rates. A move to lower tax rates will almost certainly result in lower interest rates because the government will no longer pick up 50 percent of the cost of debt. Exactly how low interest rates will go depends upon a host of factors, but a decline of 100 basis points is reasonable. As everyone in the real estate industry knows, lower interest rates are good for real estate, especially housing.

Third, tax reform means a higher homeownership rate. The SFC plan hits rental housing harder than it does the cost of homeownership for most households. In fact, if interest rates decline by 100 basis points, the cost of homeownership may actually decline for many middle-income households. Thus, it seems quite reasonable to predict that tax reform as the SFC plan describes will result in a higher aggregate homeownership rate in this country. Given that the overwhelming majority of real estate brokers serve the single-family homeowner market, such an outcome should be considered highly desirable by the majority of the real estate brokerage industry. Fourth, tax reform might mean greater rates of economic growth. The scientific basis for this statement is less certain than the first three, and so I could be accused of speaking more from my heart than my mind. Evidence is available, however, that suggests that the work effort forthcoming from many high-income professionals has increased as a direct consequence of the 1981 cut in the maximum individual tax rate from 70 to 50 percent. If tax reform can have this effect on the work effort of professionals—for example, people in the real estate brokerage industry—then tax reform could have a substantial and positive effect on long-run economic growth in this country. And, as anyone in the real estate industry will tell you, economic growth is the single most important determinant of a strong housing market.

Tax reform is a complex subject. No one who has studied it can say with certainty its final effects. Also, there will undoubtedly be some real estate losses in the short run and a rise in the long-run level of rents on residential real estate. This is inevitable given the enormous tax preferences granted to certain types of real estate earlier in this decade. However, I can say with confidence that the long-run health of our economy requires that investment decisions be based upon sound economic considerations. Given that tax reform as described in the SFC plan moves strongly in that direction, I ask that you give it serious consideration.

Summary of a speech given to the Board of Directors of the Illinois Association of REALTORS on 4 June 1986 in Springfield. James R. Follain is the Director of the Office of Real Estate Research at the University of Illinois at Urbana-Champaign.

Illinois Business Indexes

This issue of the *Illinois Business Review* highlights Illinois' building permit series. On the facing page, graphs are presented for residential housing units and the value of residential housing; industrial buildings; offices, banks, and professional buildings; stores and other mercantile buildings; and other buildings. None of the six series has been adjusted for any seasonal variation. As one would expect, therefore, there are obvious seasonal trends for all of the series.

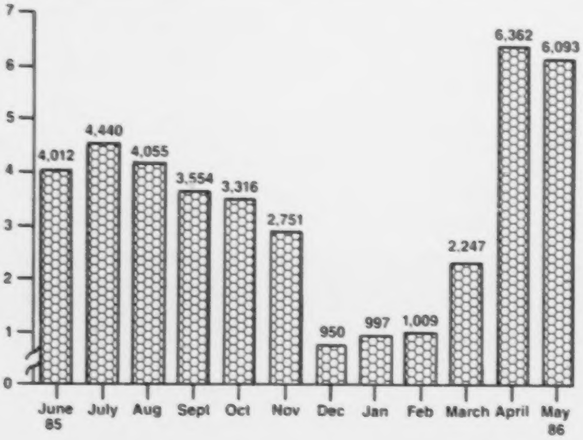
Low values for the winter months reflect decreased construction, while summer months have typically shown increased activity. The seasonal pattern is generally true for the residential housing and industrial buildings series. The other three series exhibit different behavior. The offices, banks, and professional buildings series has peaks in December and January along with troughs in April, May, and June. The stores and other mercantile buildings series shows an upturn in December and larger peaks in March, April, and May much higher than for those of June and July. The other buildings series rose in December but fell again for January, February, and March.

Illinois Business Indexes

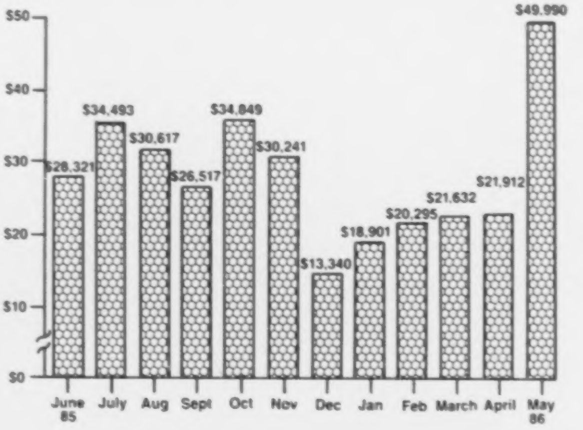
	Percent Change May 1985 May 1986	*May 1986*	*April 1986*	*March 1986*	*Feb 1986*	*May 1985*	*April 1985*
Coincident Indicator (1969 = 100)	1.87%	126.28	124.70	119.04	119.80	123.96	122.29
Employment-manufacturing (in thousands)[e]	0.84%	959.8	964.4	966.0	964.9	951.8	953.3
Average weekly hours-manufacturing[e]	1.49%	40.8	40.7	40.9	40.1	40.2	40.3
Weekly earnings-manufacturing[e]	4.04%	$432.89	$431.01	$433.13	$422.65	$416.07	$416.30
Help wanted advertising-Chicago (1969 = 100)[a]	− 7.29%	89	94	94	93	96	94
Help wanted advertising-St. Louis (1969 = 100)[a]	1.56%	65	65	70	70	64	64
Retail Sales (in millions)[b]	− 2.35%	$5,491	$5,265	$5,132	$4,355	$5,623	$5,283
Coal production (in thousands of tons)	− 11.22%	5,457	5,866	5,485	5,309	6,147	5,196
Petroleum products (in thousands of barrels)[e]	0.82%	2,450	2,510	2,502	2,650	2,430	2,593
Vendor performance[g]	25.00%	55.0%	50.0%	50.0%	48.0%	44.0%	44.0%
Building permits (in thousands)							
Residential housing units	29.20%	6.093	6.362	2.247	1.009	4.716	3.723
Value of residential housing	47.41%	$374,180	$374,451	$204,774	$111,698	$253,833	$212,888
Value of nonresidential construction							
Industrial buildings	45.13%	$49,990	$21,912	$21,632	$20,295	$34,445	$20,462
Office, banks, and professional buildings	− 7.92%	$29,418	$32,654	$8,196	$38,003	$31,949	$63,386
Stores and other mercantile buildings	39.18%	$44,558	$36,378	$38,386	$17,452	$32,014	$29,503
Other	555.59%	$2,782	$3,903	$1,282	$1,693	$6,264	$2,427
Consumer price index (December 1977 = 100)							
North Central US[c]	0.64%	—	173.9	—	175.4	—	172.8
North Central/population more than 1,250,000[c]	1.08%	—	177.8	—	179.2	—	175.9
North Central/population 385,000 to 1,250,000[c]	0.23%	—	172.1	—	173.7	—	171.7
North Central/population 75,000 to 385,000[c]	− 0.06%	—	168.5	—	170.4	—	168.6
North Central/population less than 75,000[c]	0.53%	—	170.0	—	170.7	—	169.1
Chicago (1967 = 100)	1.38%	324.2	323.7	323.9	326.4	319.8	319.1
St. Louis (1967 = 100)	0.85%	318.6	—	319.2	—	315.9	—
		1985:IV	1985:III	1985:II	1985:I	1984:IV	1984:III
Personal income (in millions)[d,e,f]	4.36%	$169,265	$165,131	$166,908	$164,894	$162,200	$160,180
Per capita personal income[d,e,f]	3.34%	$14,492	$14,148	$14,311	$14,148	$14,024	$13,871

[a] The Conference Board, *Help Wanted Advertising*, May 1986. [b] Latest month projected by BEBR. [c] Percent change between April 1985 and April 1986. [d] Percent change between 1984:IV and 1985:IV. [e] Recent month is preliminary figure. [f] Seasonally adjusted at annual rates. [g] Percentage of companies receiving slower deliveries.

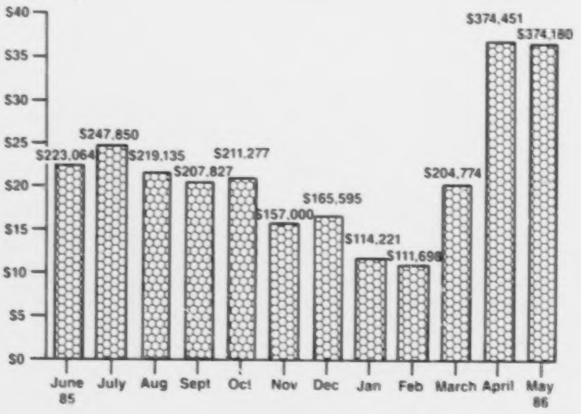
Residential Housing Units



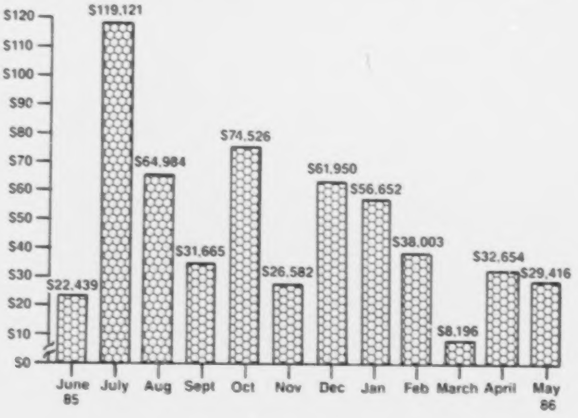
Value of Industrial Buildings (thousands of dollars)



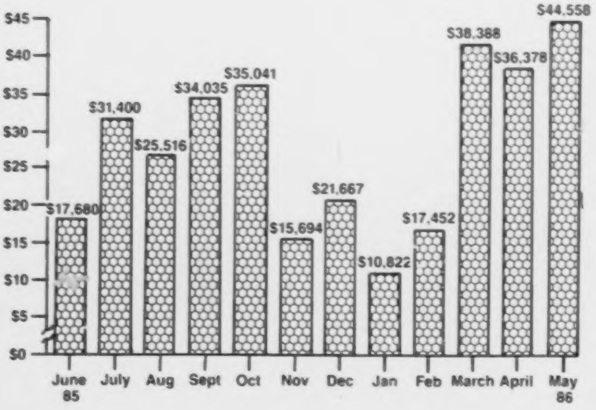
Value of Residential Housing (thousands of dollars)



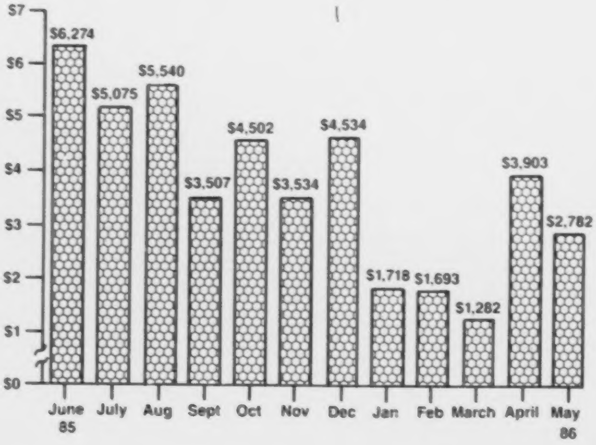
Value of Offices, Banks, and Professional Buildings (thousands of dollars)



Value of Stores and Other Mercantile Buildings (thousands of dollars)



Value of Other Buildings (thousands of dollars)



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Illinois Economic Outlook

Illinois Seasonally Adjusted Employment Forecasts (in thousands)

	History				*Forecast*			
	85:II	*85:III*	*85:IV*	*86:I*	*86:II*	*86:III*	*86:IV*	*87:I*
Total Private Employment	4068.1	4084.8	4086.1	4070.8	4062.7	4058.8	4061.7	4064.3
Nonmanufacturing	3088.2	3112.2	3109.3	3099.5	3098.2	3103.0	3110.3	3118.1
Mining	28.7	29.3	29.0	26.8	24.8	23.5	22.6	22.2
Construction	182.6	187.1	185.8	177.4	177.5	177.1	176.3	174.6
Transportation and utilities	275.6	276.6	276.1	275.5	273.2	271.2	269.6	268.2
Wholesale and retail trade	1167.2	1170.3	1171.1	1170.1	1163.7	1161.8	1161.4	1162.0
Finance	336.3	339.8	341.0	340.5	343.5	347.2	350.9	354.1
Services	1097.8	1109.1	1106.3	1109.2	1115.5	1122.2	1129.5	1137.0
Manufacturing	979.9	972.6	976.8	971.3	964.5	955.8	951.4	946.2
Durable manufacturing	604.7	596.8	598.0	594.2	589.1	581.9	576.9	573.6
Primary metals	58.1	56.2	57.0	56.3	56.1	56.7	57.7	58.1
Fabricated metals	114.4	114.7	114.7	113.4	111.9	110.4	109.3	108.2
Nonelectrical machinery	147.9	143.9	147.1	147.4	147.2	143.6	142.1	143.0
Electrical machinery	133.1	130.5	127.0	125.1	123.2	121.5	120.2	118.6
Miscellaneous durables	151.4	151.7	152.0	152.2	150.6	149.7	147.6	145.6
Nondurable manufacturing	375.8	376.4	378.6	376.1	375.4	373.9	374.5	372.6
Food products	93.5	93.3	94.3	95.1	94.2	94.3	94.3	94.0
Printing and publishing	109.4	110.6	111.0	110.4	112.1	111.2	111.6	110.3
Chemical products	58.5	58.5	57.8	57.5	58.3	58.7	58.9	59.2
Miscellaneous nondurables	114.0	113.9	114.3	113.5	110.9	109.7	109.7	109.1

The first quarter of 1986 saw a reduction in total private employment of 15,000 workers, according to the figures realeased by the Bureau of Economic Analysis. (Total private employment is the sum of the nonmanufacturing and manufacturing sectors shown in the accompanying table; it does not include employment by government agencies.) As shown in the graph, the forecast from the Illinois Econometric Model predicts further reductions in employment through the third quarter this year, followed by modest increases in the next two quarters. Although most of the employment sectors show steady drops in employment through the beginning of 1987, the continuous growth of employment in the services sectors lead the way towards a late-year increase in employment. So the model results show a steadily increasing proportion of the work force going to the services sector.

Illinois Private Employment (in thousands)